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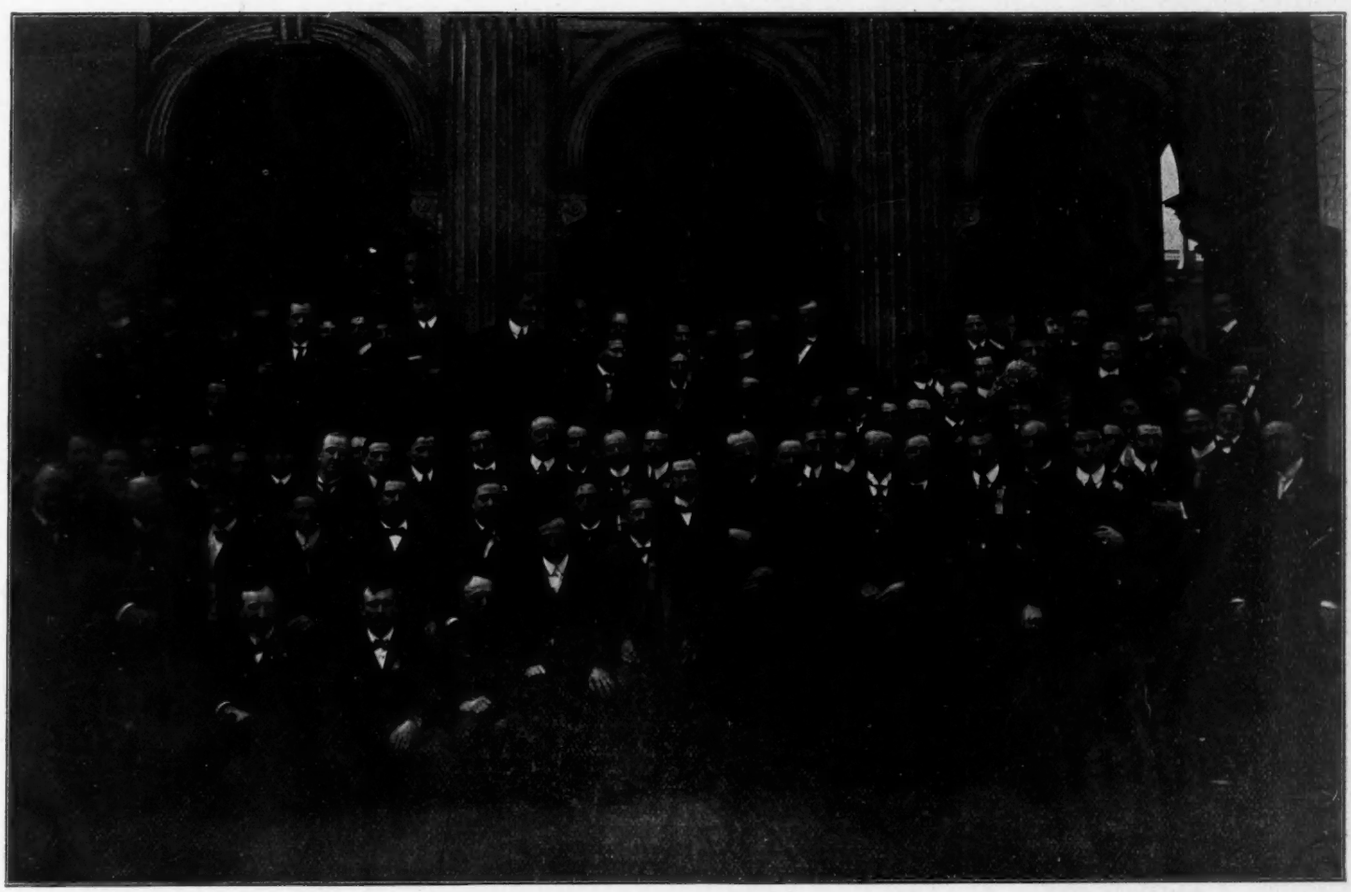
THIRD ANNUAL CONVENTION WISCONSIN INDEPENDENT TELEPHONE ASSOCIATION.

The third annual convention of the Independent Telephone Association of Wisconsin was held at the Hotel Pfister, Milwaukee, on February 19 and 20. It was one of the largest, best and most enthusiastic state conventions ever held, over two hundred representatives of Independent telephone exchanges being present.



DELEGATES TO THE THIRD ANNUAL CONVENTION OF THE INDEPENDENT TELEPHONE ASSOCIATION OF WISCONSIN, HELD AT MILWAUKEE FEBRUARY 19-20.

The first session of the convention was called to order by President A. L. Hutchinson at noon, February 19, and was devoted to the reading of the president's address and to an informal discussion of Independent telephone development in Wisconsin.

The subject of Independent toll line connections occupied much of the time at all the sessions of the convention. President Hutchinson, in his annual address, stated that the Wisconsin Telephone Company (Bell) had made a proposal to Independent companies to furnish them connections with the Wisconsin Telephone Company toll lines, and to pay to the Independent companies 10 per cent of the tolls for such connections. This proposal was made on the condition that the Independent companies should use Bell transmitters and receivers, paying a small yearly rental for their use. Contracts embodying this arrangement had been offered to many Independent companies, and the question of the acceptance or rejection of such contracts had become one of vital interest to the members of the Wisconsin Independent Telephone Association. Mr. Hutchinson strongly urged the rejection of such contracts, and stated that prospects were bright for the building of a complete Independent toll line system for Wisconsin.

After the reading of the president's address, Mr. E. R. Conklin of Aurora, Ill., and Mr. Cummings of Minnesota, informally discussed the Independent situation in their re-

spective states, and advised the rejection of the Bell proposals.

The afternoon session of February 19 was full of interest. It was devoted almost altogether to a spirited discussion of the proposed toll line connections with the Wisconsin Telephone Company.

Judge John A. Gaynor of Grand Rapids, Wis., who is a well-known figure among Wisconsin Independents, was the first speaker of the afternoon. He spoke on "The Disadvantages of Connections With the Bell Company." Judge Gaynor's address was a vigorous denunciation of Bell methods in general and of the Wisconsin Telephone Company in particular. The proposal of the Bell company to rent receivers and transmitters to Independents who would sign the Wisconsin Telephone Company's contracts was fraught with grave danger to the Independent telephone movement in Wisconsin. It meant an alliance with those who had always been the enemies of Independent telephones. It was an insidious attempt to counteract the growth of the Independent movement of the state. To accept the contracts meant to be cut off from all Independents of the state and would be a renunciation of the principles fought for since the beginning of Independent telephony.

The making of a contract of any kind with the Bell company would be a breach of faith with the public, whose support alone had made Independent success possible.

RICHARD VALENTINE.

A. L. HUTCHINSON.

There was in the question more than a mere matter of dollars and cents. The vital principles of the anti-monopoly movement were at stake. Time alone could solve the problem, but experience had shown that capital would interest itself in profitable enterprises demanded by public necessity, and if the Independents of Wisconsin would all stand together and unite in an effort to secure Independent toll lines, there would be no lack of capital to build them in the course of a year or two, and to wait that long was far better than to make common cause with the enemy.

At the conclusion of Judge Gaynor's address the secretary read the following invitations:

Milwaukee, Wis., February 19, 1902.

To the Wisconsin Independent Telephone Association, Assembled.

Gentlemen:—On behalf of the Illinois Independent Telephone Association, I beg to extend to you a cordial invitation to attend the annual convention of our association, to be held in Chicago on April 9, 10 and 11. A very complete program has been arranged and a banquet will be tendered by the telephone manufacturers, supply houses and manufacturers of telephone appurtenances and accessories. This invitation is extended to your honorable association as a body, to members individually and to every Independent telephone man in the state of Wisconsin.

I. A. LUMPKIN, President.

Milwaukee, Wis., February 19, 1902.

To the Wisconsin Independent Telephone Association, Assembled.

Gentlemen:—The telephone manufacturers, supply men and manufacturers of telephone appurtenances and accessories, beg to extend to the Wisconsin Independent Telephone Association, and to every Independent telephone man in the state of Wisconsin, a cordial invitation to partake of a banquet to be tendered at the Sherman House, Chicago, on April 9, 1902. Invitations for this banquet have been sent to all the Independent telephone men in Illinois and adjoining states. On April 9, 10 and 11 the Illinois Independent Telephone Association will hold its annual convention, at which time the organization of the Interstate Independent Telephone Association will be completed and officers elected, in pursuance of a meeting recently held at the Palmer House, Chicago. To carry out this plan, the banquet and a number of other features have been arranged, and it is earnestly requested that all Independent telephone men in the states mentioned should attend.

I. A. LUMPKIN,
J. J. NATE,
S. A. DINSMORE,
W. E. BURKE,
H. B. MCMEAL,
Committee.

The president then invited Dr. Lumpkin and Messrs. J. J. Nate, S. A. Dinsmore and H. B. McMeal to address the convention. Each of these gentlemen strongly urged the attendance of all Wisconsin Independents at Chicago on April, 9, 10 and 11.

By unanimous vote the invitations were accepted and the convention resolved to attend in a body.

The discussion of Judge Gaynor's address was then taken up. Mr. G. D. Jones of Wausau and Mr. H. C. Hackney of Delavan thought the proposed contracts with the Wisconsin Telephone Company would be a good thing for Independents. They stated that their subscribers were in urgent need of long-distance connections and that their support would not be given to the Independent exchanges if they could not get toll line service. Mr. Jones especially made a very powerful argument in favor of the acceptance of the Wisconsin Telephone Company's contracts, urging that it would enable the Independents to control the exchange business of the state, and would confine the Bell company to toll line business. There seemed to be no reasonable expectation of getting Independent toll lines for years to come, and some provision must be made to give Independent subscribers long-distance connections. The proposal to use Bell receivers and transmitters would not destroy the Independent movement, but would strengthen it in all the local exchanges.

The views of Mr. Jones and Mr. Hackney were not those of the majority of the convention, and Mr. Richard Valentine of Janesville, in an eloquent speech, denied the advantages of Bell connections and said that the Independents were strong enough to fight the monopoly and needed no assistance from the Bell company. He said that so long as the Independents were weak the Bell company had fought them. Now that the Independents were powerful their former enemy sought their friendship. Unconditional surrender was the only answer to Bell proposals, and the true Independent would sacrifice his time, his money and his interests rather than make a compromise with a foe whose only object was to lull the Independents into a fancied security, and then to take them unawares and destroy them one by one.

The company which would sign such a contract was no longer an Independent and should be cut off from Independent connections, and expelled from membership in the Independent Telephone Association of Wisconsin.

An informal discussion by various delegates concluded the session, the decided majority of opinion being opposed to the making of any contracts whatever with the Bell company. Just before adjournment a committee consisting of G. D. Jones, R. Valentine, J. C. Murdock, J. R. Gaynor and J. M. Baer was appointed to report on some practicable means of securing Independent toll line service.

At the morning session of February 20 Mr. F. S. Veeder read the report of the committee appointed at the preceding annual convention on toll rates and the division of such rates between the companies interested. The committee recommended that the combination toll rate be two-thirds of the local toll rates, and be divided on the basis of one-half of the sum of air line and pole line distance between entering and outgoing stations of the companies transmitting such messages, figuring each exchange as equal to three miles of line.

It was later decided to allow the committee further time for investigation of the subject.

Mr. E. B. Fisher of Grand Rapids, Mich., secretary of the Citizens' Telephone Company, delivered a very able address on the subject "Possibilities of Association Effort." Mr. Fisher described at length the marvelous growth of Independent telephony and especially cited the progress made in the state of Michigan. This was due to the fact that earnest and concerted effort had been made by the Independent companies for the betterment of telephone conditions, not only in the immediate vicinity of the local exchange, but everywhere throughout the whole state. It would be better for the various exchanges always to be owned by different companies than to have the entire business controlled by one company. A friendly rivalry between various companies, each striving to attain the highest degree of excellence, would be a continuing guarantee of good telephone service and would insure the public's support. But to succeed harmony and united effort are essential, and especially ought every Independent company to lend its hearty support to its state association and to the national association.

Mr. Fisher spoke earnestly in favor of a spirit of complete co-operation and said that united Independents were invincible, and only by a division of factions could the enemy hope to suceed in its endeavors to overthrow the Independent movement.

The committee appointed to investigate the proposed toll line connections with the Wisconsin Telephone Company next presented its report in opposition to the acceptance by Independents of the Bell contracts. The report follows:

"In the judgment of your committee to obtain the best telephone service requires the largest possible telephone connection. We believe it is against good public policy, therefore, to enter into any contract that will limit the use of telephone service to instruments of any one manufacture or that will make discrimination against any properly constructed toll line or telephone exchange."

The recommendation of the committee was enthusiastically adopted as the sense of the convention.

The convention then listened to an able paper on "Bridging Generators," by Mr. Charles W. Farr of Chicago, president of the Farr Telephone and Construction Supply Company. Mr. Farr said the best generator was always the cheapest in the long run and urged careful and discriminate tests in order to secure the best results

Mr. R. G. Abbott, of the John A. Roebling's Sons Company, followed Mr. Farr, addressing the convention on "Telephone Cables and Their Construction." Mr. Abbott's paper was a clear and concise statement of actual conditions and contained valuable suggestions with reference to the purchase and installation of cables.

Mr. James E. Keelyn of Chicago, president of the Keelyn Telephone Manufacturing Company, spoke on "The Relation of the Manufacturers to the Operating Companies." Mr. Keelyn advocated the co-operation of the manufacturer with his customers, and of the customers with the manufacturers, in order to produce the best grade of telephone apparatus. The standardizing of telephone apparatus was impossible, and if it were not impossible it would be a mistake. No two men could ever agree on the same standard, and only by the mutual assistance of manufacturer and user would perfect telephone service become possible.

At the afternoon session Mr. H. R. Ritter of Madison read a paper on "Telephone Construction and Material," giving some valuable and practical suggestions for telephone users. Mr. Ritter urged the need of high grade telephone service, which could only be secured by the use of high grade apparatus.

The convention then voted to meet at Waupaca, June 24-26, and to hold its next annual meeting at Milwaukee in February, 1903.

After the transaction of routine business the convention proceeded to the election of officers for the ensuing year, the following being the new officers selected:

President—Richard Valentine, Janesville.
Vice-President—H. D. Slater, Waupaca.
Secretary and Treasurer—H. C. Winter, Madison.

The convention then adjourned.

Elaborate and very attractive exhibits of telephone apparatus and supplies were made by leading manufacturers and supply houses. The extent and variety of exhibits has seldom been equaled at a state convention.

The Chicago delegation returned home Thursday night in a special car chartered by Mr. Frank G. Jones, president of the American Electric Fuse Company.

A pleasant feature of the convention was the attendance of the wives of several of the delegates, the lady telephonists all being very enthusiastic Independents.

PUBLIC OWNERSHIP OF TELEPHONES.

There is reason to believe that the telephone may become a more important means of communication than either the telegraph or the post. It is at the same time an assistant and a rival of the older systems, says Municipal Monopolies. All these means of transmission should be operated together for the sake of good service, economy and harmonious development. The same considerations that have induced so many nations to put the telegraph in the postoffice, caused Germany, Luxemburg, Wurtemberg, Bulgaria, Bavaria and other countries to make the telephone also a part of the postal system from the start. In other countries, like Austria, Belgium, France, Switzerland, Sweden and Great Britain, telephone exchanges were first established by private companies, but the rapidly growing importance to the public of a cheap, extensive and efficient telephone service, managed in connection with the telegraph and the mail, brought about a movement toward public ownership which resulted in national purchase of the private exchanges, and the establishment of new ones by the state, so that in the first four countries mentioned above, the telephone has become entirely a public institution. In Sweden the transformation is nearing completion, and in England the trunk lines have become postal property, and it is generally believed that the government will acquire the entire business of the exchanges when the National Telephone Company's license expires. In Italy and Spain concessions of twenty-five and thirty years have been granted to private companies on condition that at the end of the franchise term the telephone system shall become public property without any payment to the companies.

In Denmark, Finland and Norway the exchanges are largely in the hands of local companies, coöperative societies, municipalities and rural authorities. The trunk lines in Denmark and Norway are built and maintained by co-operative agreement among the exchanges. The cost of a trunk line is apportioned among the societies using it, and each exchange retains the whole of its receipts for talks over the trunk line. In Finland an interurban company owns the trunk lines. In Holland the government supplied the materials, and the companies owning the exchanges supplied the labor to build trunk lines. These lines are maintained by the government, which receives 75 per cent of the trunk-line tolls. In Russia and Hungary some exchanges are public and some are private property. In Portugal and the United States the business is substantially all controlled by a big private monopoly.

ANNUAL ADDRESS OF A. L. HUTCHINSON, PRESIDENT OF THE INDEPENDENT TELEPHONE ASSOCIATION OF WISCONSIN.

Less than two years ago the first meeting of the Independent telephone companies of Wisconsin was held and this association organized.

The growth of the Independent telephone business in Wisconsin since that time has been enormous. There are to-day in the state over 160 distinct telephone companies, not including several properties owned by individuals. An effort to secure statistics from the entire state has been only partially successful, but reports received make the following showing total mileage of toll lines 6,935, of which 3,000 are metallic circuit. The number of exchanges is 130; number of toll stations, 629; total number of telephones in operation, 17,763. The capital invested is $1,467,900, of which $445,320 was invested in 1901. These figures would be increased at least 25 per cent by reports from the remaining companies.

The most noticeable fact in connection with these reports is the extremely small mileage of copper lines. However, the greater amount of money invested the past two years has been in constructing large city exchanges, and the near future will see these cities connected with copper lines.

There is no business on earth which not only admits of, but actually demands, such wide expansion as the telephone business, and no business requiring closer attention to make it a complete success.

Its nature has been the cause of this state of affairs. During the days of Bell monopoly that corporation was content to let villages of 1,000 population, or less, get along with but one telephone for a central office, while in exchanges one telephone to every hundred of the population made a large exchange. Consequently when the Independent companies first entered the field they had no conception of the results of low rates and good service. Capital would be invested sufficient to build an exchange equal to that of the older company. Bell toll lines would be paralelled and it was then thought that the business, with a trouble man to look after it, would take care of itself. But no greater mistake was ever made, and the business to-day suffers from the fact that so many interested in it make it a side issue and do not give it the attention it requires and is entitled to.

This condition of affairs naturally brings before us the question of telephone finance. Unlike the conditions of ordinary corporations, the construction work of a telephone plant is never completed; its capital account can never be closed. Acting upon a contrary belief, telephone companies have organized with a certain amount of capital and invested the same in construction; the profits of the business have then been invested in additional construction and dividends passed. No matter how large the profits of a company might be, they would be totally inadequate to supply the increasing demand for telephones. The passing of dividends and the ever-increasing demand for more capital to invest has created in the minds of the outside investor the mistaken idea that telephone business is anything but profitable, and, no matter how successful a company may have been, if it is unable to raise funds to supply the increasing demand for telephones, it soon finds itself in financial straits.

I know of but one remedy, but that remedy is specific. If an investor can be assured of regular returns on his investment he is only too willing to invest. The rate of interest at which a bond can be sold depends upon the ability of the maker to meet the interest and the principal when due. The greater the ability the lower rate of interest that can be secured. The success of the Independent telephone business depends largely upon having stockholders scattered through every community, the more the better, for every stockholder is constantly saying a good word for the company in which he is interested.

In every community there is more or less capital seeking investment. Money deposited in banks does not draw to exceed 3 per cent, and most banks do not pay but 2½ per cent on time deposits. There is not a telephone company in existence but that, if properly managed, can pay at least 6 per cent to its stockholders and maintain the same low rate of rentals and tolls which have taken the telephone from the category of luxuries and placed it among the necessities of life.

Once the investor is assured that the stock he holds is as good as a certificate of deposit in his local bank, there will be no trouble in providing ample capital to thoroughly develop every town, city, village and rural district in the land.

There is no reason why such a condition should not be obtained. The business, unlike many large enterprises, does not have to depend upon time contracts for profits, but the dimes and nickels and quarters are constantly dropping into the treasury, and the rentals are usually paid in advance. There is under such an absolutely sure cash business no reason under heaven why capital should not be seeking investment in telephone stocks, except the one fact that heretofore the profits have not been paid to the stockholder whose money had contributed to earn those profits, but have been reinvested and the stockholder comforted by telling him that his stock is worth so much more. Such comfort may do for investments already made, but it does not inspire the investment of new capital.

One company doing business in Wisconsin has not only adopted the plan of paying a dividend of 3 per cent to its preferred stockholders every six months, but it has gone farther and adopted a by-law, by which, at the end of two years, if any stockholder desires to sell his stock, the company will, upon ninety days' notice, resell or repurchase such stock at par, plus any unpaid dividends. The company is acting upon the theory that if a man can get his money he does not want it, but if he needs it the company should assist him in getting it, rather than have him dump his stock upon the market at a price far below its value in order to realize the required cash.

The sooner the companies of this state adopt some method whereby their stockholders are assured of a certain cash income from their investments at stated periods, the easier it will be for the companies to provide funds for the complete development of the territory in which they operate.

In an article recently published I suggested that there should be a telephone stock exchange established in this state; that companies desiring to place stock upon the market should do so through such exchange. That when a stockholder wished to sell his holdings he should have the privilege of doing so through the same exchange. The cost of selling stock to any company through a central exchange would be much less than for an individual company to advertise and sell its own stock. I now repeat the suggestion that such an exchange be established and hope to have the suggestion discussed at this meeting.

An attempt was made at our last annual meeting to adopt a uniform system of toll rates, and a committee was appointed to investigate the matter and make a report. If that committee is ready to report at this meeting, well and good, but if not, some action is necessary and some method should be adopted whereby the companies of this association may have a fixed rule to go by, both in the amount charged for toll messages and in the division of moneys received.

At a meeting of the executive committee, held last spring after the annual meeting, specifications for construction of toll lines were adopted and copies sent to all the companies in the state, with a request that they be followed as closely as possible. I believe that the construction of toll lines is far better to-day than it was two years ago, but there is still room for improvement. If the work is worth doing at all it is worth doing well, and good work is the most profitable in the long run.

The bankers' committee, appointed to untangle the af-

fairs of the Everett-Moore syndicate, was at first disposed to part with the telephone properties controlled by the syndicate, but a careful investigation of the books by experts and an inspection of the construction work of the toll lines and exchanges, revealed the fact that the companies were all paying investments, and the construction work unsurpassed by that of any other company. No better or higher praise could be given the Independent telephone movement than the report of this committee, which sought to rid itself of every poor piece of property held by the syndicate.

The recent decision in the Carty patent suit, brought by the Bell company for using the bridging system, was as sweeping a victory for the Independent companies as was the decision in the Berliner case last year.

However, the Independent companies of Wisconsin are menaced to-day by a state of affairs that strikes a blow direct at the solar-plexus. Realizing that it is a life and death struggle, the Bell company is sending emissaries to various Independent companies in the state with a proposition to allow the Independent company to control the exchanges if the toll business is given to the Bell company.

The contract proposed by the Bell company requires: First, that its instruments shall be substituted by the Independent company for those instruments now in use; second, that such Independent company shall not thereafter connect its lines or subscribers with any other Independent company; third, that such contract shall be for a period of ten years.

After the brilliant record made by the Independent companies in Wisconsin during the past two years, with the investment of half a million of dollars the last year, it would seem surprising that any Independent in Wisconsin would for a moment consider such a proposition, and, yet surprising as it may seem, directors of certain companies have actually voted to accept the conditions and sell their birthright to the Bell company.

It should be the work of this association to use every means possible to prevent any Independent company from cutting itself aloof and tying up with Bell interests. If education and proper showings of what has been accomplished in the past two years are not sufficient, then those stockholders who are opposed to the action of their company's directors should have the financial support of this association in any legal proceedings which may be instituted to enjoin the directors from making such a contract.

To have any single company in the state tie up with the Bell company is of vital importance to every other Independent company in the state, and the true Independents must stand by each other.

The Independent company which will enter into such a contract is as much a traitor to the Independent telephone business as were those men traitors to the Union who advocated secession.

So far as I have been able to learn, the only excuse offered is the lack of long-distance toll lines. Having waited for years without any toll line connections whatever, as has been the case with some Independent companies, they have all at once discovered that they cannot exist another year without the opportunity to talk at long range.

When we consider the rapid development of the state; that every city of any size, except Milwaukee, now has an exchange or has granted a franchise for a local exchange, and in every instance but one or two wherever built, the local exchange is from 25 to 4,000 per cent larger than the Bell exchange in the same city, a little reflection will show to the candid man that toll lines connections with copper circuits will be a necessary result within the next few months. Careful estimates show that from 75 to 85 per cent of toll work is done with cities within a radius of forty miles. So that the number of subscribers who have use for the long-distance lines can better afford to rent a Bell telephone for long-distance work than he can afford to have his local company become a part of the Bell system.

But even for long-distance work the time is far less than ten years distant, when every city in the Union will be connected with Wisconsin with long-distance lines. Chicago is now constructing a local exchange, and the Cream City of the world will finally fall into line as surely as night follows day.

MEETING OF NEBRASKA INDEPENDENT TELEPHONE ASSOCIATION.

The third annual meeting of the Nebraska Independent Telephone Association was held at the parlors of the Lincoln Hotel, Lincoln, Neb., February 17 and 18, 1902. A committee of three, composed of Messrs. A. E. Gantt of Falls City, Byron Clark of Plattsmouth, and C. W. Hansen of Fairbury, was appointed to meet at Nebraska City to draft an agreement which all corporations, companies and individuals operating Independent telephone systems in Nebraska, and being members of this association, shall sign, the object of which is to protect the Independent interests in the state, and any member of the association is required to notify the secretary of the said association before offering to dispose of his or their telephone properties to any competing company; to regulate toll charges and exchange rates and the interchange of toll business; to provide through metallic trunk lines connecting the principal Independent telephone systems of the state.

The Union Commercial Club of Lincoln, through its secretary, Mr. E. C. Rowick, extended an invitation to the Association to meet with the Commercial Club in a body at their rooms to discuss the Independent telephone question as relating to Lincoln. The Commercial Club, alive to the interests of Lincoln, requested different members of the Association to give their views as to whether an Independent telephone system in Lincoln would be to the best interest of the citizens. Among the speakers were: A. E. Gantt of Falls City, E. C. Hansen of Fairbury, T. H. Pollock and Byron Clark of Plattsmouth, A. M. Munn of Nebraska City, J. H. Currie of Bradshaw, and a number of Lincoln citizens. The matter was thoroughly discussed, Mr. J. E. Miller, of the firm of Miller & Paine, Mr. J. W. McDonald, president of the First National Bank, and Mayor Winnett, all of Lincoln, speaking in favor of granting a franchise to The Plattsmouth Telephone Company, which has been making strenuous efforts for the past two years to establish an exchange in Lincoln.

The officers elected for the ensuing year were as follows: Thomas E. Parmele, Plattsmouth, president; I. D. Clarke, Papillion, vice-president; E. C. Hansen, Fairbury, secretary and treasurer. The Association adopted as the official emblem the Maltese Cross, with the words, "Independent Telephone System, Local and Long Distance."

The Association has increased in the three years of its existence from a membership of five companies the first year to nearly one hundred members at its third annual meeeting, and the prospects are that the membership will increase 100 per cent by the next meeting.

Mr. T. H. Pollock, general manager of the Plattsmouth Telephone Company, and retiring secretary of the Association, is in receipt of numerous inquiries for suitable locations for telephone investments in Nebraska, and will take pleasure in giving information as to the situation in the state, and will also assist in obtaining franchises for outside parties when so requested.

TELEPHONE TEST SATISFACTORY.

A special test of the train telephone system of communication with the general offices over telegraph wires has lately been made on the Illinois division of the Chicago, Milwaukee and St. Paul Railway. The test was made on a special train in charge of Superintendent G. R. Morrison, Trainmaster Tucker of Savanna; Superintendent of Telegraph U. J. Fry and Chief Electrician W. H. Elliott of Milwaukee. The test was declared satisfactory.

DIGEST OF TELEPHONE AND KINDRED PATENTS.

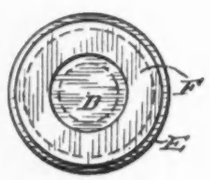
CONDUCTED BY EDWARD E. CLEMENT.

685,429.—G. Osten and W. P. Spalding. Diagram for Acoustical Apparatus.

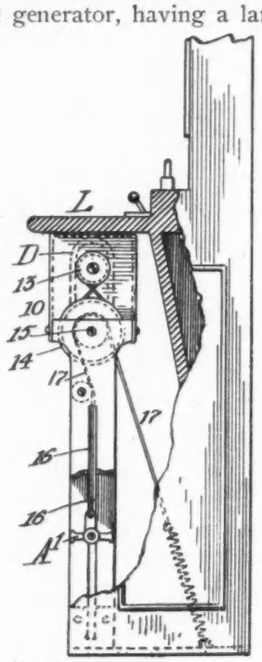
This is a diaphragm made of wood-pulp paper, treated with a solution of bi-carbonate of soda in distilled water, which makes it tough, then washed in distilled water and let stand in a solution of chloride of gold, then dried and treated with a solution of nitrate of silver with cyanide of potassium. The paper is finally pressed between pieces of clean paper covered with a warm, smooth weight. This is said to make a very sensitive diaphragm.

685,685.—E. Krahenbuhl. Power Generator for Telephones.

This is a power generator worked by foot power. The idea is to get plenty of power and leave the operator's hands free. In the drawing, which shows a small switchboard partly in section, D is the generator, having a large



685,429—DIAPHRAGM



685,685—POWER GENERATOR

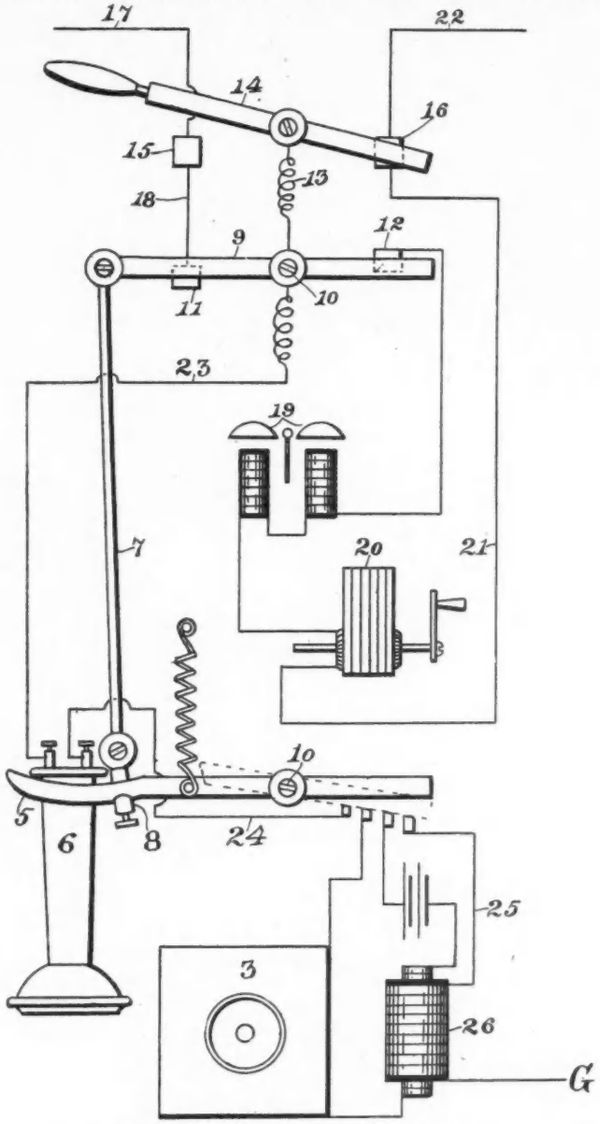
gear wheel 14 driven by a belt passing down at one end by a strap 17 to a spring, and by the other end through a rod connection 16 to a stirrup A', which when pushed down by the foot will work the generator and will be returned by the spring.

685,715.—F. A. Cumings. Secrecy Telephone System.

This is a reversing switch for through lines, to be applied to any telephone, whereby the talking apparatus may be connected to the line going one way or the other, but the bell and generator will be properly connected in a line at all times when the receiver is on the hook. 9 is a pivoted lever bridging the terminals 11-12 and normally held in this position when the hook 5 is down. 14 is a rocking lever connecting through wires 13-23 to the receiver 6 and the transmitter and coil to ground, when the switch is up. By throwing the lever 14 up or down the wire 23-13 may be connected to line wires 17 or 22 at will.

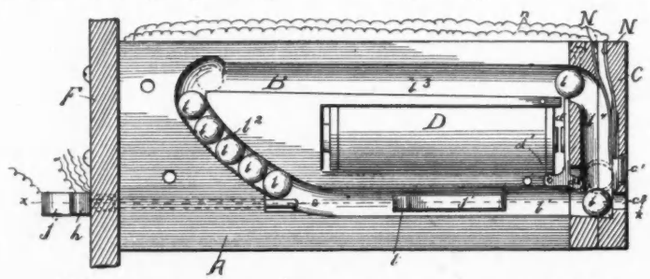
685,846.—H. F. Jones. Switchboard for Telephones or Like Exchanges.

This is really a combined annunciator and spring jack. The inventor's idea is to use balls sliding in a runway as a signal. The runway consists of three parts, a bottom horizontal channel, a rear ascending channel and a top channel descending toward the front. The balls normally rest in the bottom part of the runway, with a single ball at the forward end of the top runway, being detained there by the armature of a magnet D. This magnet is included through the anvils and line springs of the jack, in circuit with the line. When a subscriber rings the ball b is released and falls through the vertical channel in front of the window c', closing the night bell springs N-N' and displaying itself as a signal. There is always one ball resting as shown back of the jack opening c3, and when a plug



685,715—SECRECY TELEPHONE SYSTEM.

is inserted this is pushed back and against the ascending roll of balls at the rear, forcing the top one into the dotted line position, whence it runs down the channel b3 to the front. When the ball is pushed back past spring j' this and a twin spring are spread out against generator termi-



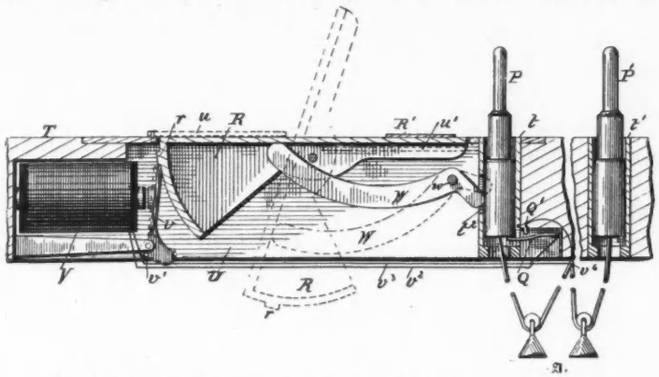
685,846—SWITCHBOARD FOR TELEPHONE OR LIKE EXCHANGES.

nals. A spring plunger is provided at the rear to cut in the operator's set.

The toll counter is shown as applied to the front of the drop, its registering train in a flat case and actuated by a bent lever reaching into the path of the balls.

685,847.—H. F. Jones. Switchboard for Telephone or Like Exchanges.

This invention embraces a mechanically improved drop and jack, substantially the same as that just described and illustrated, with a number of details elaborated. In addition a clearing-out signal is shown as herewith illustrated, con-



685,847—SWITCHBOARD FOR TELEPHONE OR LIKE EXCHANGES.

sisting of a pivoted shutter R held by the armature b of a magnet V, and permitted to fall when the subscriber rings off. An arm W then projects into the path of the plug P so that when the plug is put into its seat it will restore the shutter to the position shown in solid line.

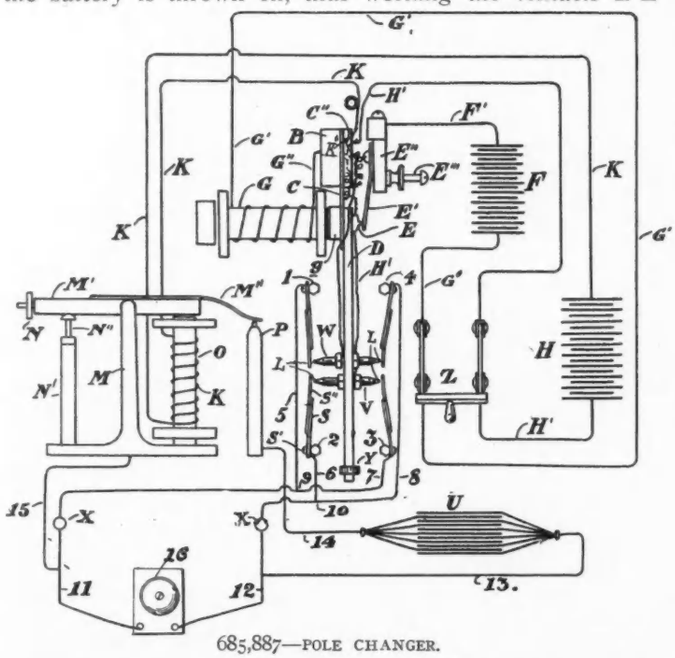
DESIGN.

23,266.—R. M. Eaton. Telephone Transmitter Box.

This is a combined transmitter box and vibrating bell. A switchhook is mounted also in the box and a push button of carbon. The patent covers the design merely.

685,887.—W. F. Warner. Pole Changer.

This is the Warner Pole Changer, used in many small exchanges instead of a ringing generator. A vibrator G keeps the pole changing lever D constantly moving when the battery is thrown on, thus working the contacts L-L

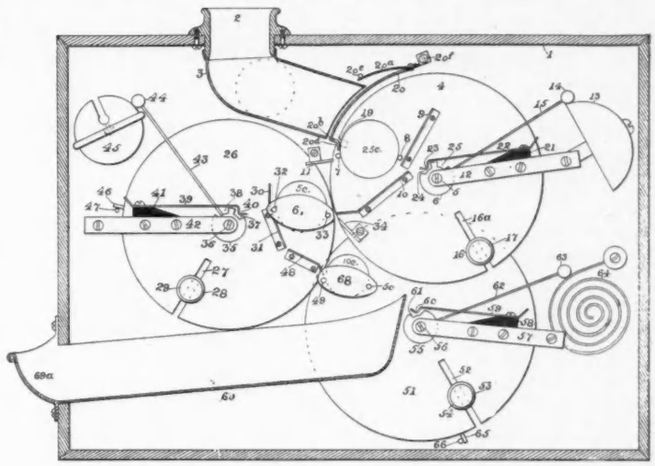


685,887—POLE CHANGER.

alternately against the springs 1-2-3-4 for the purpose of sending opposite pulsations to line. M is a relay which cuts in the condenser U when the circuit K is closed, this serving to take up the spark.

686,074.—A. Holzmann. Telephone Toll Signal and Collector.

This is a toll receiver and annunciator. A series of wheels 4-26-51 are pivoted as shown, each having guides 9-10, 31-48 and 68. Wheel 4 has pins 7-8 spaced the proper distance apart to receive and hold a quarter when the same descends from the shute 2. A smaller coin will fall through and be deflected by the guide 10 and into the space between the pins 32-33, where it will stick if it is a nickel, but will pass on past guide 48 into space between the pins 49-50 if smaller, and will stick in the last named place if it is a dime. Coins of the wrong size or slugs will be thrown into the trough 69 and rejected. When a coin lodges between pin 7-8 on wheel 4 the weight of the coin causes the wheel to turn on its pivot until the coin falls off into the box, when the wheel will return to the position shown, under the influence of the weight 17. In so doing the hammer 14 will strike a sharp blow on the bell 13 and if

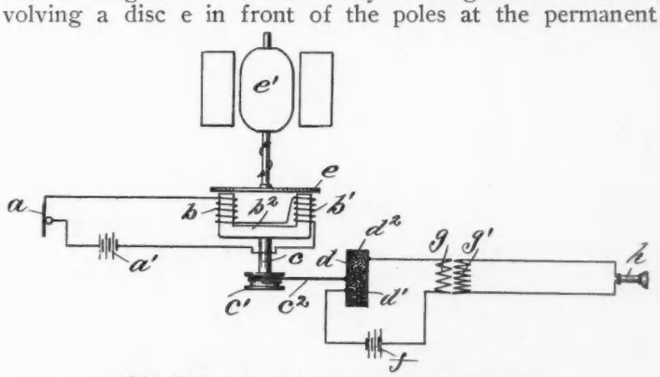


686,074—TELEPHONE TOLL SIGNAL AND COLLECTOR.

desired the make and break wheel and pen 6-23 will make and break the local circuit also. Each of the other wheels will act in the same way when a coin lodges on it and each wheel has a bell or gong of distinctive tone.

686,206.—C. J. Coleman. Repeater for Telephone Circuits.

This is a relay whereby mechanical energy may be controlled by electrical undulations so as to amplify the same. a is the transmitter producing undulations in the currents passing to the coils b b' wound upon the poles of a permanent magnet b2. A constantly rotating motor e' is revolving a disc e in front of the poles at the permanent



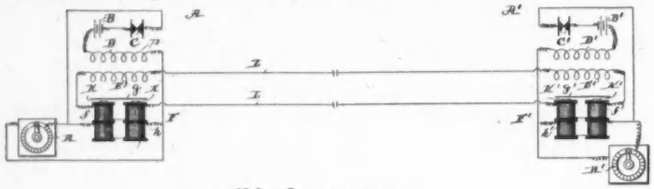
686,206—REPEATER FOR TELEPHONE CIRCUITS.

magnets without cessation. The permanent magnet is mounted on a shaft c, upon which is also carried a drum c'. Upon this drum is wound a cord c2 connected to the diaphragm of a microphone d, which varies the current in a local circuit, repeating through induction g-g' into the line.

As the disc is constantly revolved in the direction of the arrow it tends to carry with it the permanent magnet b2, but the tension of the pull thus exerted on the cord c2 is finally adjusted and becomes a constant. The variations in the current, however, produce changes in the strength of the magnetism and consequent variations in the pull.

686,228.—I. Kitsee. Telephony.

This is a duplex system, but just what its application is in the art is a problem. A and A′ are terminal stations connected by the line wires LL. Each station has a transmitter C working into primary D of an induction coil, and in series therewith a pair of coils h on the receiver magnets, these being shunted by an adjustable resistance R. The line is connected to the secondary E and the main receiver windings f. The operation is as follows: When the

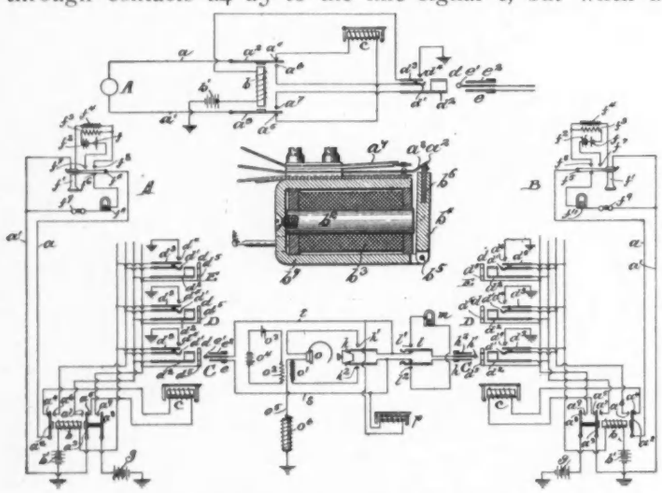


686,228—TELEPHONY.

transmitter C produces variations in the current central line it also produces equal and opposite variations in the current flowing through coils h, the action of coils f-h thus neutralizing each other, while incoming currents over the line will affect the coils f only.

686,272.—F. W. Dunbar. Telephone Switchboard System.

This is a system now largely used by the Kellogg Switchboard and Supply Company, and while shown as a magneto system it is very generally applied to common battery installations. The gist of the invention is shown in the upper part of the figure. The subscriber's line a-a′ passes from the station A to the central office, where it terminates at the armatures a2, a3 of the magnet b, which is itself included in circuit b′, this circuit adapted to be closed at the contacts d3 d4 when a plug is inserted in the jack d2. Normally, therefore, the line a-a′ is connected through contacts a4 a5 to the line signal c, but when a



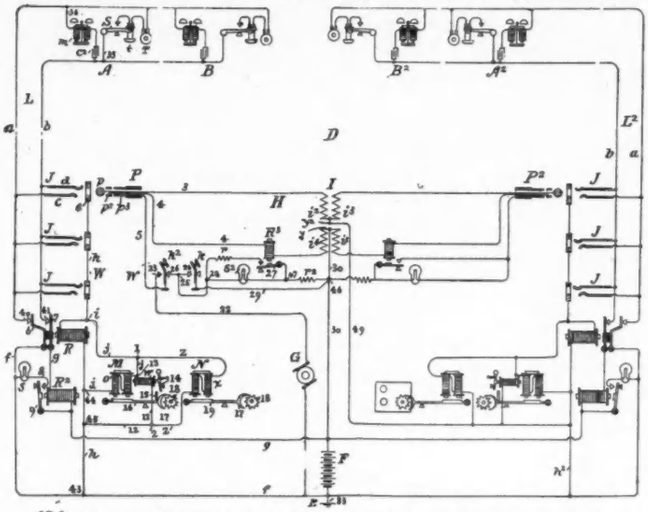
686,272—TELEPHONE SWITCHBOARD SYSTEM.

plug is inserted in answer to a call the magnet b receives current and pulls down the armatures a2 a3 to connect the line to the spring jack d2. Referring now to the lower figure, a number of multiple jacks D E are shown, each of them fitted with the contacts referred to, so that the relay b will be energized no matter what jack the plug is inserted in, in order to cut off the line signal and connect the line to the jack.

In the smaller figure the relay b is shown more in detail. The armature b4 controls all of the springs, being fitted with an insulating pin b6 which lifts the springs a2, etc., from their normal resting contacts and puts them on the back contacts.

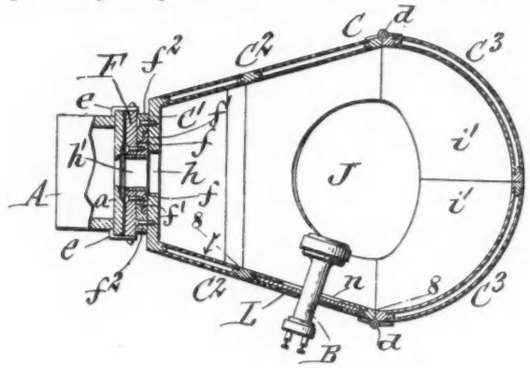
686,340.—E. C. Robes. Service Meter Apparatus for Telephone Circuits.

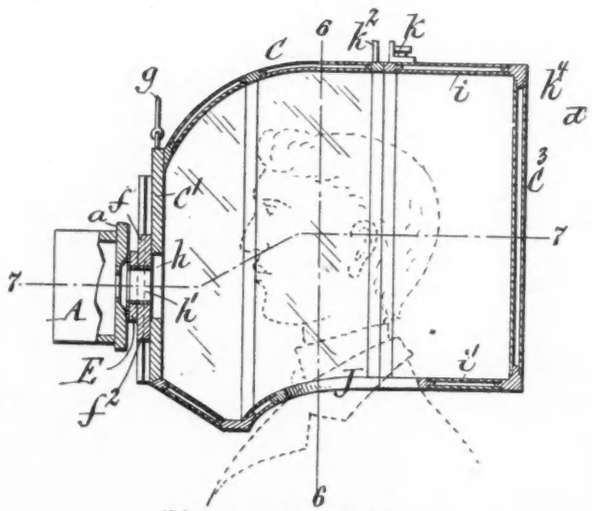
This is a meter arrangement for common battery relay switchboards and especially for two party line circuits. The meters are all located at the central office, two meters being connected to each line circuit, one for each station. The magnets M N in the figure are the controlling magnets of the two meters for line a-b, being included in parallel with



686,340—SERVICE METER APPARATUS FOR TELEPHONE CIRCUITS.

each other and with the cut-off relay R, and all receiving currents through the test ring circuit W when a plug is inserted. This circuit is normally open at one of two keys k-k2 on the operator's table, but closed at the other through the supervisory lamp resistance and its shunt. Two sources





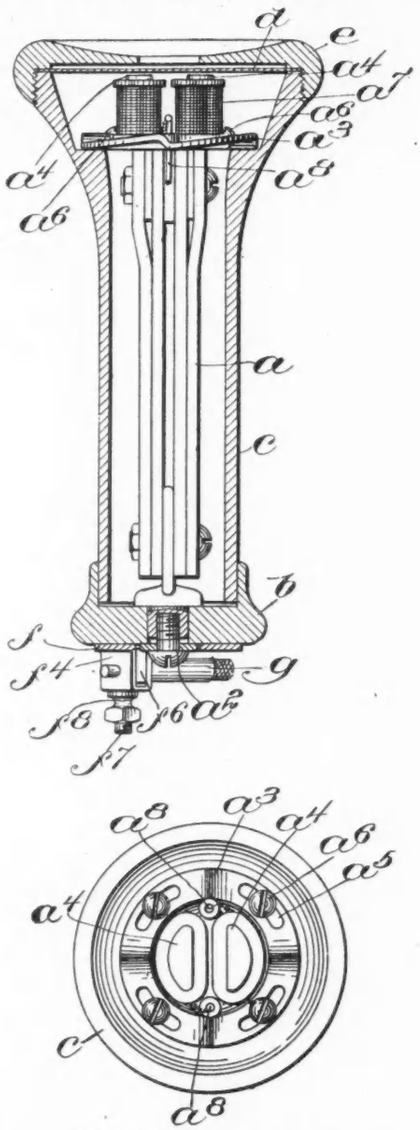
686,423—TELEPHONE CABINET.

of current are provided, F-G, the former of which can be applied to circuit W, clear of resistances by key k, and the latter by key k2. The source f furnishes current of "medium strength," while the generator G furnishes very "strong" current. The magnet M is sluggish and it has a locking magnet w which is quick acting, and in case of

a strong current passing will pull over the armature 14 until it rests over the stop 15 on the actuating arm 16. The magnet M is quick acting and works on a strong current. Thus it will be seen that the operator can register the call of one station by putting on a medium current with key k, which will energize magnet M, but will not work the other magnets. Conversely, she may register the call of the other station by putting on a strong current which will work magnet N and will operate the lock-out magnet w before the sluggish magnet M has time to work.

686,423.—E. W. Smith. Telephone Cabinet.

This is a hollow chamber C, preferably with glass walls with an intermediate air space, and with a hole J in the bottom and doors C at the back. The cabinet has an opening at the front to connect with the transmitter A, and the receiver is fastened in the side wall as shown. In use the user incloses his head in the cabinet.



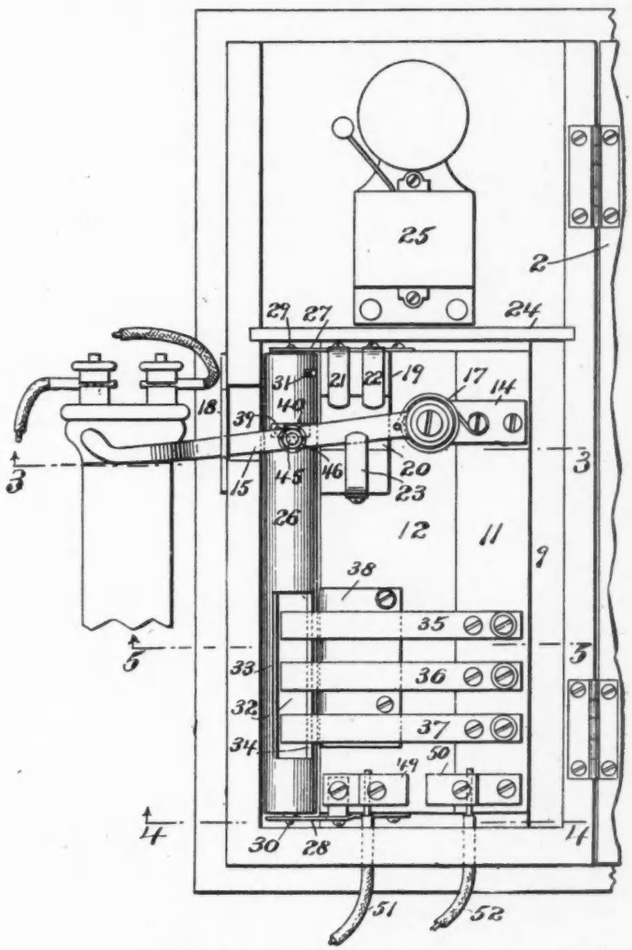
686,488—TELEPHONE RECEIVER.

686,488.—W. F. Taylor. Telephone Receiver.

This is the receiver now largely put out by the Holtzer-Cabot Company. The bi-polar magnets a has pole pieces a4 which are straight on their inner surfaces and convex on their outer. The principal feature of the receiver, however, is the adjustment. This consists of four inclined surfaces formed in the enlarged part of the shell c. The magnet structure carries a pressed metal ring a3 having inclined surfaces adapted to rise and fall on the other inclined surfaces if the magnet structure is turned in the shell. To retain it when adjusted four set screws a6 are provided, working in slots in the ring.

686,608.—E. W. Hazazer. Telephone Apparatus.

This is an intercommunicating telephone for a system where each station has an individual wire, with one common return. The connections are made by means of push buttons pushing in the springs 35-36-37, which overlie the plate 38, constituting the home terminal. The ends of the springs project over a slot in the cylinder 26, and when they press it around, by pushing down against one end of the slot, the other edge is turned over the particular spring that it depressed to serve as a detent. The switchhook 15 has a cam faced pin working against a spring finger 40, which in the downward movement of the hook turns the cylinder back to normal and releases the spring.



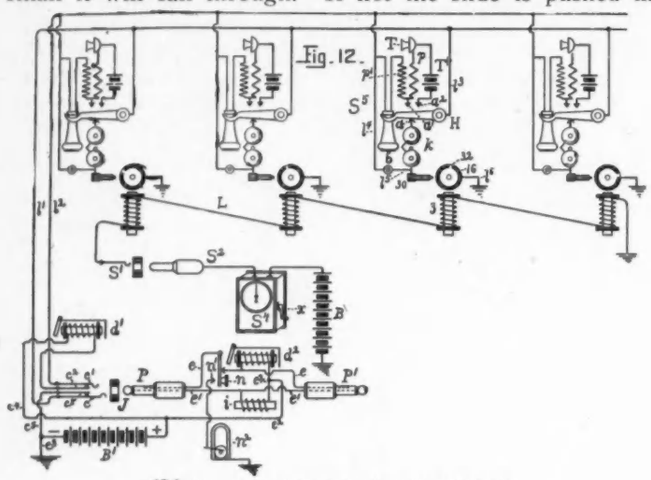
686,608—TELEPHONE APPARATUS.

686,925.—T. C. Drake. Party Line Selector System.

This is a system for party line s having step by step mechanism at each station for making a connection with the ringer at that station by a predetermined number of impulses sent from the central office. The system shown is central energy, the main B′ and a ringing generator n2 in the ground cap. A separate selector circuit is used for the magnets 3, each selector disc having its contact point 32 differently located from all the others and grounding its ringer k at that point. The signals are sent from central by plugging into a jack s′ and turning a crank x on the indicator box S4, which shows on its face when the required number of impulses have been sent. The description and claims are largely take up with details of mechanical construction.

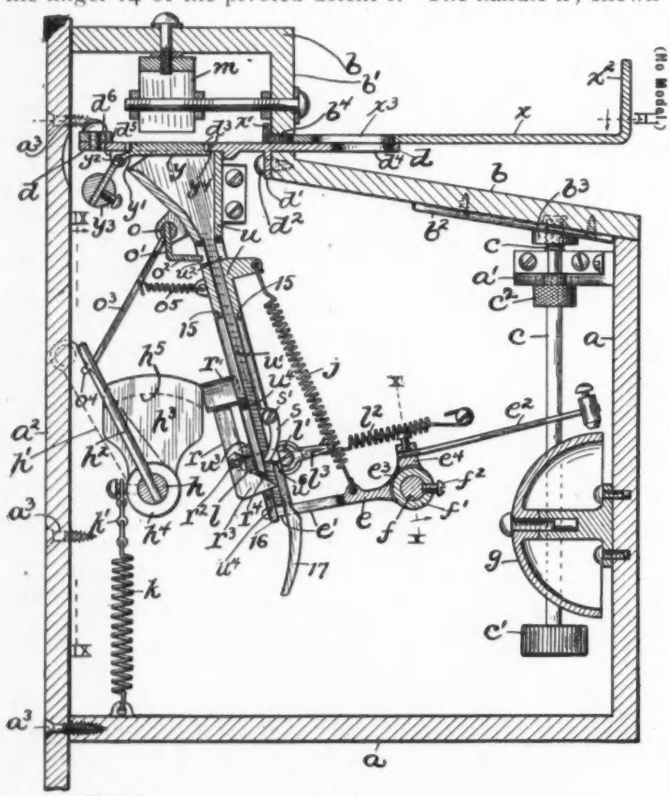
687,008.—W. A. Foss. Toll Collecting Machine for Telephones.

This is a toll collecting device arranged like the chocolate machines and chewing gum dispensers. The user puts a coin in the hole x3 in the slide x. If the coin is too small it will fall through. If not the slide is pushed in,



686,925—PARTY LINE SELECTOR SYSTEM.

locating the coin on a tilting drop y under a magnet m. If a slug has been put in the magnet will keep it from falling through, and the slide will bring it out again. If it is a proper coin it will be sufficiently heavy to tilt down the drop y and fall into the shute u', where it goes on until it strikes the finger r4 of the pivoted detent r. The handle h', shown

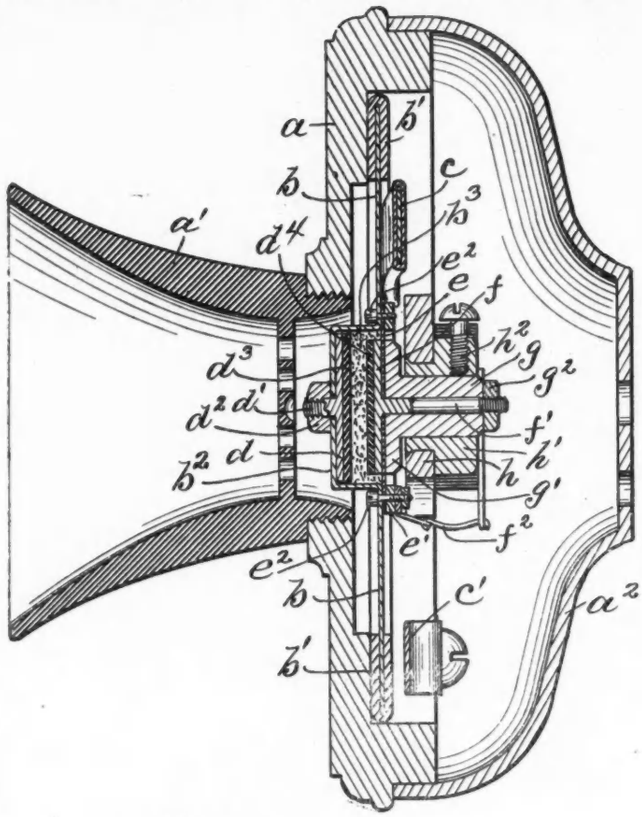


687,008—TOLL COLLECTING MACHINE FOR TELEPHONES.

in dotted lines, and located on the outside of the box, is then pulled forward, whereby the cam h3 pushes down the coin and depresses the end of the lever e turning it on the pivot f and lifting the hammer e2 so that when the coin falls out the hammer descends and strikes the blow.

687,499.—W. W. Dean. Telephone Transmitter.

This is a transmitter which might well be called "solid back," although it involves a complete reversal of the solid back construction in so far as the electro chamber is concerned. The diaphragm b is formed out at the center into a chamber b3, in which one electrode d3 is bottomed. The other electrode d4 is secured to a supplemental diaphragm e, which is clamped securely to the principal diaphragm all

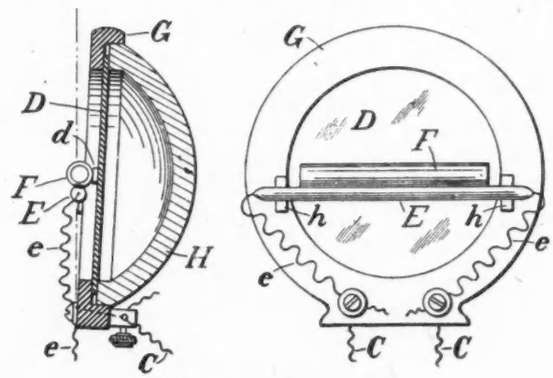


687,499—TELEPHONE TRANSMITTER.

around the opening. The carbon chamber is thus formed in the diaphragm and has one electrode firmly secured to it, while the other electrode d4 has its stem g secured in the usual way by set screws h2 in the bridge h.

687,681.—M. Gally. Electrical Apparatus.

This is a microphone transmitter without microphone contact and yet involving the microphonic principle. The figure shows rear view and a vertical section of a transmitter embodying the invention. A conducting pencil E of high resistance is included in the primary circuit e and the flow of current there through is constant. Attached

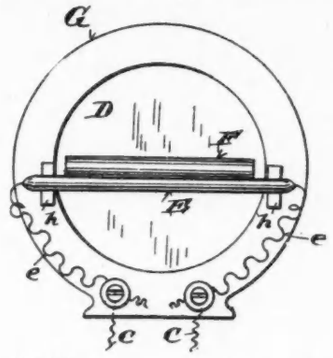


687,681—ELECTRICAL APPARATUS.

to the diaphragm is a pencil F of much lower resistance than the pencil E. As this normally rests against the pencil E it constitutes a low resistance shunt therefore, but as the diaphragm vibrates the sliding motion is said to affect the current so as to produce the proper variations.

687,682.—M. Gally. Electrical Apparatus.

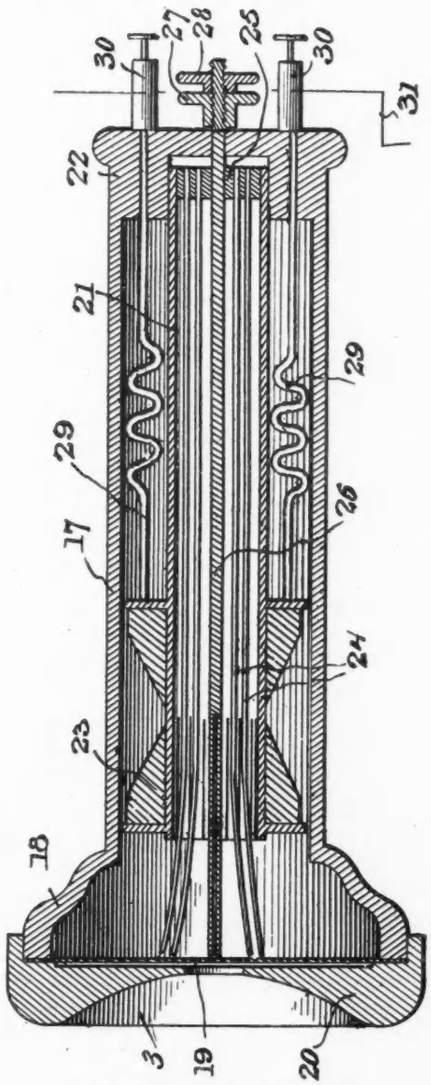
The invention in this case is the same as in the preceding one, the only difference being that the conductivity of the pencil E is made variable through its length, being greater in the end than it is in the middle.



687,682—TELEPHONIC APPARATUS.

687,996.—H. Liebreich. Telephone Receiver.

The invention in this case consists of a receiver having one or more diaphragms, a core 21 comprising a split cylinder adapted to be magnetized and demagnetized a coil

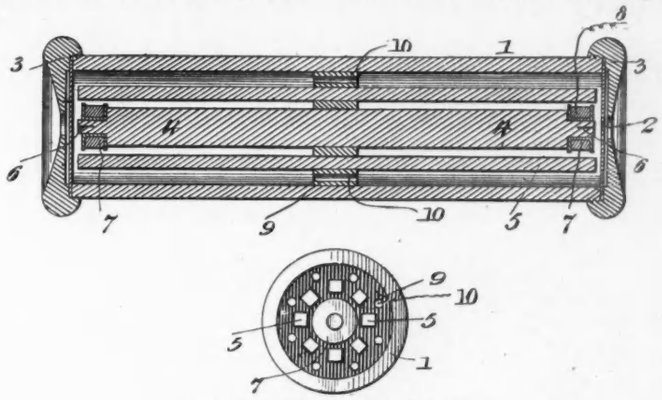


687,996—TELEPHONE RECEIVER.

23 on the cylinder, and a series of magnets 24 mounted so as to be able to vibrate within the cylinder and to act on the diaphragm.

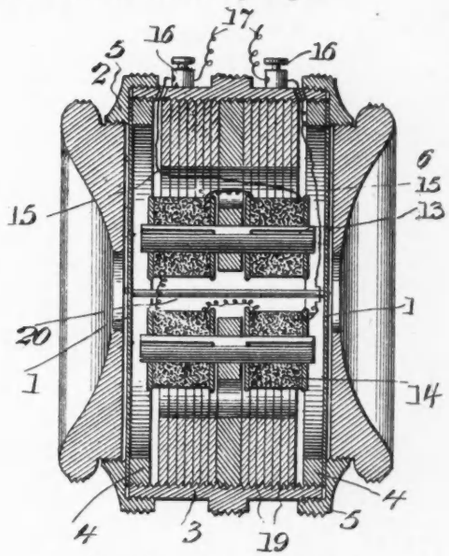
687,997.—H. Liebreich. Telephone Receiver.

The invention in this case consists of a receiver having one or more diaphragms and a series of magnets 4 and 5,



687,997—TELEPHONE RECEIVER.

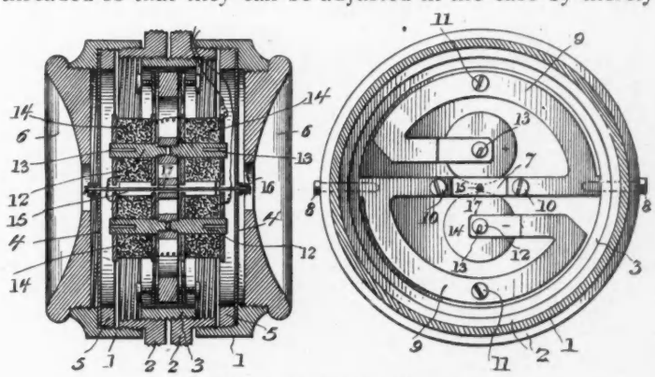
some of them, as 4, having coils and the others being simply grouped so as to affect the diaphragm.



687,998—TELEPHONE RECEIVER.

687,998.—H. Liebreich. Telephone Receiver.

This is a receiver with two diaphragms having compound ring magnets firmly secured together and screw threaded so that they can be adjusted in the case by merely



687,999—TELEPHONE RECEIVER.

turning them. The diaphragms are connected together by rod 20 so that they will vibrate as one.

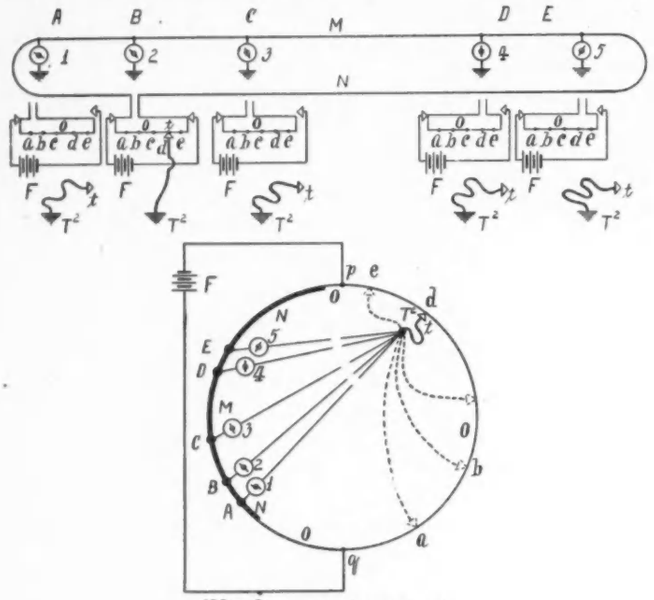
687,999.—H. Liebreich. Telephone Receiver.

This is a receiver of the same type as the preceding one. In this case, however, S-shaped magnets are employed having leaves 9-9 secured to opposite sides thereof and

adjustable to and from the magnets by screws 11, to vary the strength of the magnets, it is stated. The two diaphragms in this case are connected by a piece of catgut.

688,118.—S. A. Reed. Selective System.

This is a party line selective system in which the Wheatstone bridge principle is employed. The figure selected is greatly simplified, as the system and apparatus are both quite complicated. Stations A, B, C, D and E all have balancing resistances, means for cutting into the line and means for varying the resistances in such manner

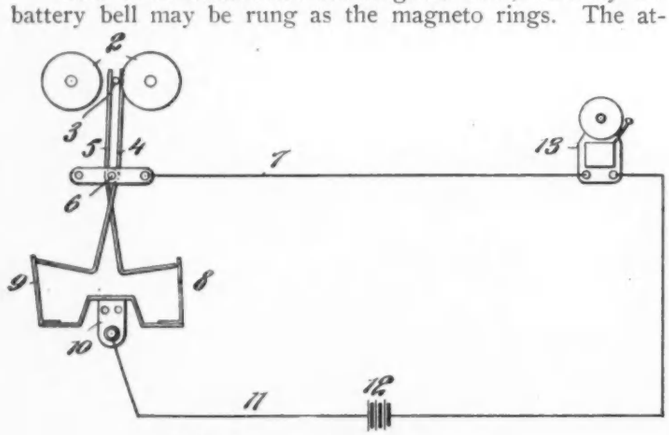


688,118—SELECTIVE SYSTEM.

as to throw the line into or out of balance for any particular station. This idea can be grasped most easily from the lower figure, where the diagram shows the stations with their calling lines all bunched and a common terminal T2 traveling over a path of resistance p-q, by assuming different positions on which the bridge can be balanced for any one of the stations, but all the rest will thereby be left out. The upper diagram shows the development of this principle as applied to a common metallic talking circuit M, N, which contains resistances between the stations, the bridge wire being a common ground. Obviously any station by working the contact t along the resistance path a, b, c, d, e may balance the line for any one of the galvanometers 1, 2, 3, 4, 5, and thereby select the one desired.

688,124.—J. A. Rice. Telephone Attachment.

This is an attachment for magneto bells, whereby the battery bell may be rung as the magneto rings. The at-

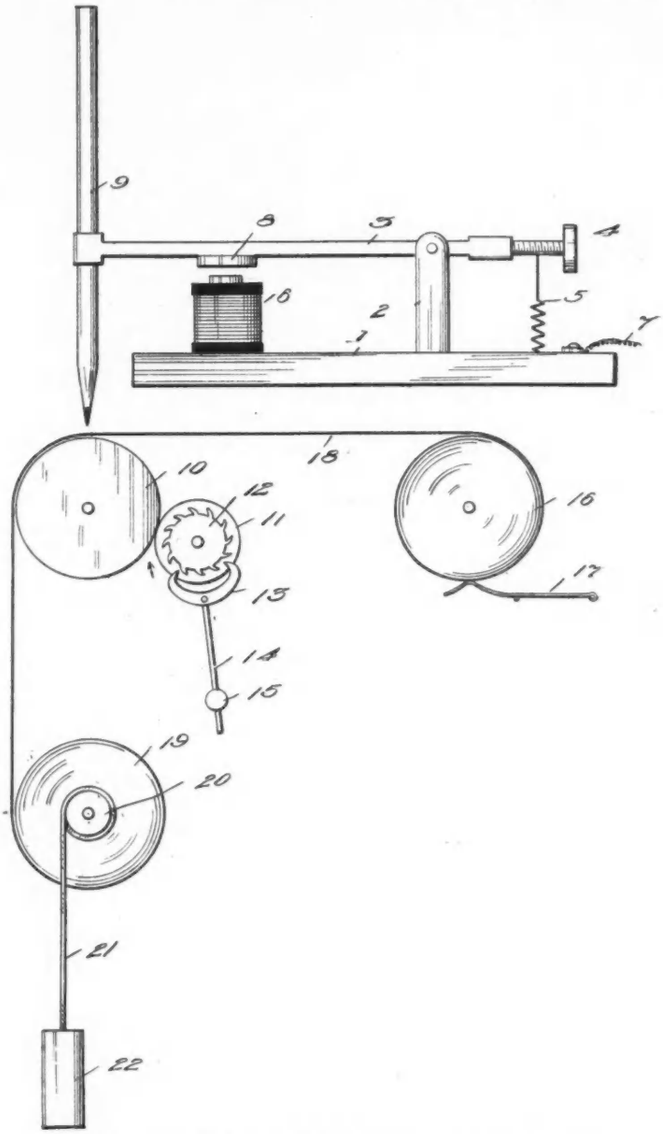


688,124—TELEPHONE ATTACHMENT.

tachment consists of two wires 4-5 bent as shown and pivoted at 6. The upper ends of these wires embrace the clapper 3 of the magneto 2. The lower ends, when vibrated, make and break contact with the uprights 8-9, the wires and uprights being included in the circuits 7-11, together with the battery and bell.

688,184.—J. B. Lee. Automatic Monitor. For Telephone Exchanges.

According to this invention a telegraph recorder is included in the night bell circuit of a switchboard. In the present case the recorder has a roll of paper 16 transversely ruled for time divisions and continuously drawn over the



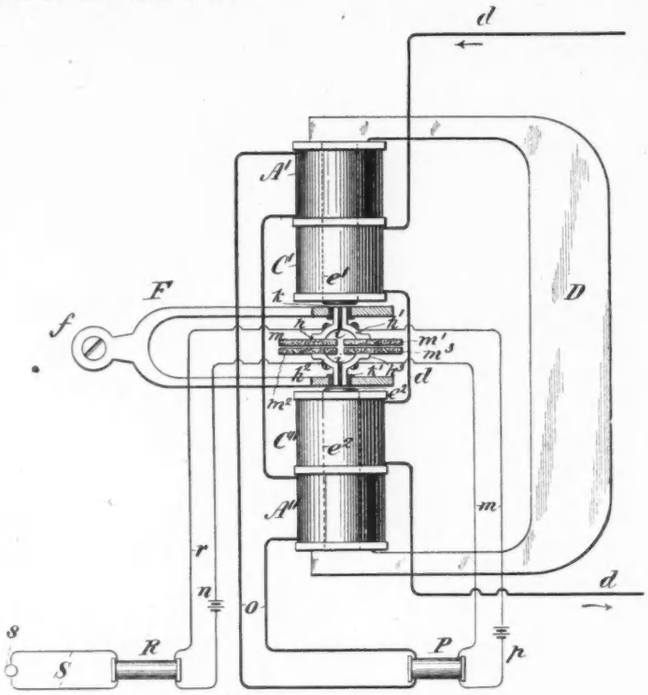
688,184—AUTOMATIC MONITOR FOR TELEPHONE EXCHANGES.

guide roll 10 onto the spring or weight actuated drum 19. When a call comes in the magnet 6 pulls down the pencil 9 onto the paper, and as the latter moves a continuous mark is made which indicates not only the time of the call but the lapse of time until it is answered.

688,293.—G. A. Cardwell. Telephony.

This is a repeater consisting of a permanent magnet D, having double coils A′ C′ and A″ C″ on its pole cases. Between these pieces lies a fork F, having between its tines the microphone contacts m m2 and m′ m3, the pairs of which are insulated from each other. The line circuit d comes in to coils C′ C″ and the fork vibrates in accordance with the variations of current on the line, the microphone m′ m3 then producing changes in the local circuit m which are repeated through the coil P into circuit O, including coils

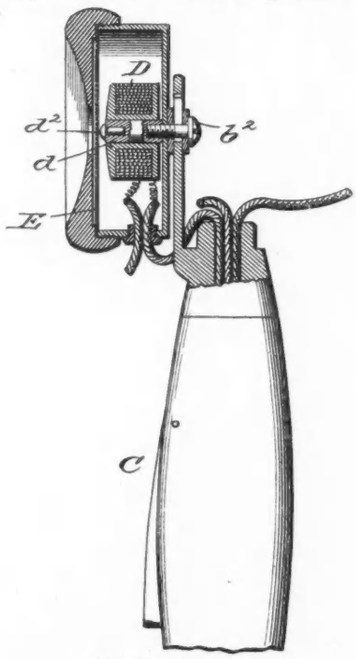
A' and A", thereby reinforcing the action of the line coils on the magnet. At the same time the microphone m m2 receives the amplified vibrations and repeats them through coil R into circuit S.



688,293—TELEPHONY.

688,676.—W. S. Paca. Telephone.

The entire invention in this case consists in the damper d2 let into the pole piece of the magnet D and having a

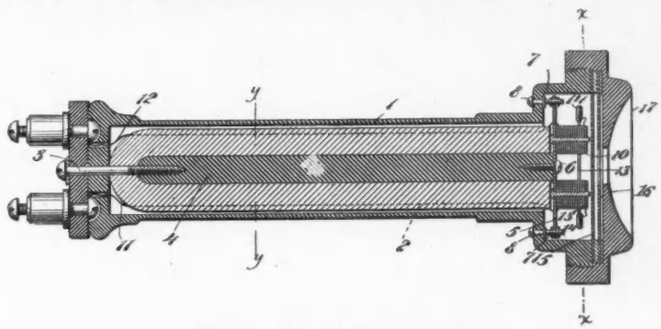


688,676—TELEPHONE.

head lightly touching the diaphragm. The body of the damper d is made of some fibrous substance, leather or felt.

688,433.—F. J. Orr. Telephone Receiver.

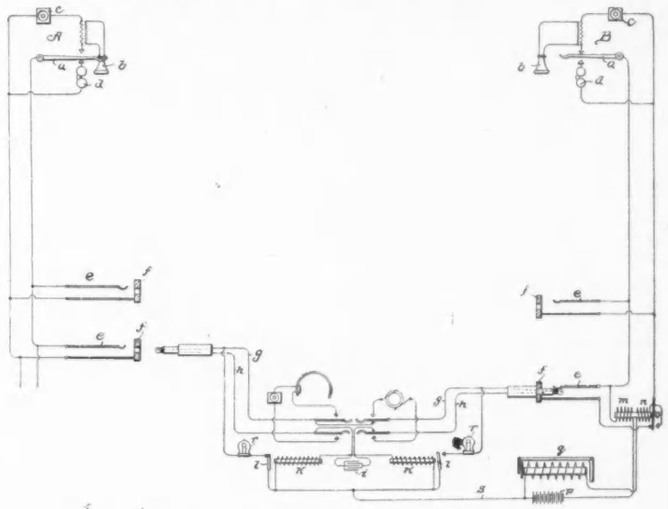
This is a receiver having a piece of wood or rubber 4 set in between the limbs of the magnet and receiving the securing screw 3 at one end and the screw 6 at the other, the idea being to prevent the transmission of vibrations. The pole pieces and coils are supported on a brass plate 5, and a microphone consisting of a pencil presumably of carbon supported between two screws 14 is included in the circuit of the coils, and is supposed to increase the sensitiveness of the instrument. A double diaphragm is employed for reasons that are not very clear.



688,433—TELEPHONE RECEIVER.

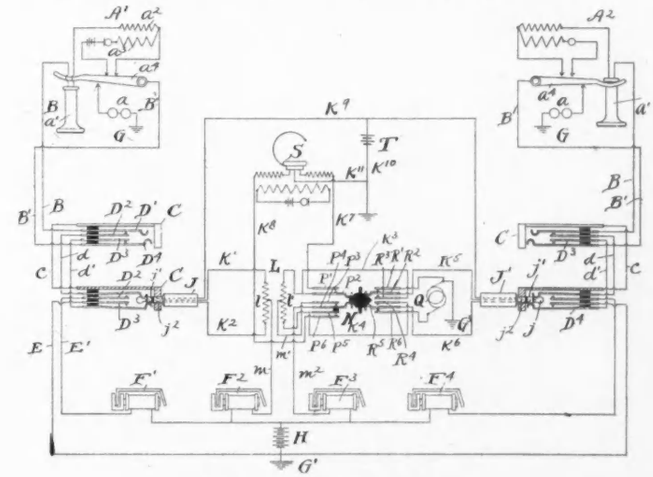
688,452.—H. G. Webster. Telephone Exchange System.

This is a Stromberg-Carlson system. The line circuit comes into central and passes through opposite windings m n on a relay, and then to main battery p and the line



688,452—TELEPHONE EXCHANGE SYSTEM.

signal q. When the subscriber calls the line signal responds, but the relay m n does not, because the coils neutralize each other. When the operator plugs in, coil m is



688,673—TELEPHONE SYSTEM.

in local circuit through the tip of the plug, lamp r, armature l, and wire s to the battery p. The coil n is practically shunted out and the armature o is therefore pulled over, cutting off the coil n permanently from line and leaving

the coil m connected in series with the supervisory magnet k. In cutting coil n the magnet q was cut off at the same time.

688,673.—C. H. North. Telephone System.

This is a system with common battery for calling and local battery for talking, or common battery for both, and is adapted for simple or multiple boards. A multiple board is shown. The subscriber's bell a is in a ground tap in each case, and calling in is accomplished over the metallic circuit, current flowing from the battery H through the line signal F' and out over line and back to battery. The test rings are all connected together and when a plug is inserted they are connected through the sleeve thereof to the test battery T and ground, the line signals being cut out in the jack. The cords are separated by repeating coils L, whereby the lines are separated, and from the middle point of each winding a wire is taken off to a supervisory signal F2 and F3, and thence to battery H, which is grounded on the other side. There are no grounds on the lines during conversation, but when the subscriber hangs up the grounds of the bell branches are put on and current at once flows from the grounded main battery through the supervisories to energize the same.

DECISIONS AFFECTING TELEPHONY.

PREPARED FOR TELEPHONY BY ANDREWS & MURDOCH, BERRIEN SPRINGS, MICH.

A BOND TO SECURE COMPETITION.

The city of New Britain, Conn., and the New Britain Telephone Company entered into an agreement by which the city permitted the company to use certain poles belonging to the city for its telephone lines, reserving to the city the use of the top arm of each pole, and by which the company agree (1) to permit the city to use the top arm of all poles owned by said company or which may be hereafter erected by it; (2) to furnish and set new poles whenever and wherever the city may wish to extend its lines, free of charge; and (3) to furnish all city departments all telephones they may order put in, at the agreed price of $13.50 net each per year. The contract was for a period of twenty years. At the time the agreement was made the telephone company, as principal, with certain sureties executed to the city a bond in the sum of $2,500, which, among other things, provided as follows:

"If the said obligor shall sell its property, or its control shall go into the hands of other parties, or its competition with the Southern New England Telephone Company, its assigns or successors, shall not be kept up, or if the control of said obligor shall pass, either directly or indirectly, into the hands of said Southern New England Telephone Company, its assigns or successors, then this bond shall be in full force and effect; and in case of the said obligor ceasing its competition with or coming under the control of the Southern New England Telephone Company, its assigns or successors, then, and in that event, said sum of twenty-five hundred dollars shall be considered as liquidated damages, and the full amount thereof shall be paid to the city; but otherwise to be void and of no effect."

The New Britain Telephone Company afterward came under the control of the Southern New England Telephone Company, and a suit was commenced on the bond. A very interesting question of public policy might have been injected into the case if the court had found it necessary to decide as to the validity of the bond to secure competition between the two companies. The Supreme Court of Errors of Connecticut evaded this question and held the bond valid as securing the other agreements in the contract, and sustained a judgment of the lower court for the full amount of the bond.

50 At. Rep. 881.

BRANCH LINE—ELEVATION OVER RAILROAD TRACK.

C. C. Kersh, a railway employe, was injured by being struck by a telephone wire suspended across a railway track. This wire was a part of a branch line to connect with the American Telegraph & Telephone Company's main line. The company constructed the branch line and furnished the wire, while a private person furnished the right of way and poles and assisted in its construction. The American Telegraph & Telephone Company rented the telephone to such private person and divided with him the tolls, and had at different times made repairs on the branch line, but it denied ownership or duty to keep it in repair. *Held,* that the jury were justified in finding that the company owned and controlled the branch line, and hence was liable for negligence in failing to so suspend the wire across the railway tracks as to permit the passing of trains with safety to persons on the top of a car.

66 S. W., Rep. 74.

DEFECTIVE POLE—UNPRECEDENTED STORM.

In the Circuit Court for Harris County, Texas, a judgment for $215.00 was rendered against the Southwestern Telegraph & Telephone Company in favor of M. Ingrand, as damages done to his store in Houston, claimed to have resulted from negligence of the company in placing and erecting near said building an insufficient and insecure telephone pole, which fell, and caused the injury complained of. The telephone company appealed the case to the Court of Civil Appeals of Texas, which has reversed the lower court and ordered a new trial in the following opinion:

Briefly stated, the facts disclosed by the record are as follows: The pole in question was erected by appellant on the edge of the sidewalk, and ran up through the awning in front of appellee's building in the city of Houston. It was fifty feet long and twenty inches in diameter at the base, and was placed six and one-half feet in the ground. At the time it was put up (about three years before the injury complained of) it was properly inspected, and found to be a good, sound pole, suitable in every way for the purpose for which it was used, according to the testimony of the only witness who knew anything about the condition of the pole at the time it was put up. During the storm of September 8, 1900, the pole broke just where it passed through the awning of appellee's building, and also a short distance above the awning. The top portion of the pole, after it broke in two, was held suspended by the wires which were fastened to it. The awning fell, and the end of appellee's building was either pulled out by the wires which ran over it and were pulled down by the weight of the pole suspended to them, or was battered down by the suspended portion of the pole as it was blown to and fro by the wind. The evidence shows that appellee was damaged in the amount adjudged him by the court below. Three witnesses testified that they examined the broken pole on the morning after the storm, and that it had the dry rot. Two of these witnesses say that it was rotten near the center, but they do not state to what extent, but they say that it appeared perfectly sound on the outside. The other witness says that he saw a rotten place on one side of the pole. He did not examine to see how far the rot extended into the pole, but that it extended four or five inches toward the center. The undisputed evidence shows that the storm of September 8, 1900, at Houston, was of such unprecedented violence and fury as to come within the category of occurrences denominated the act of God. Four witnesses testified that they had examined the pole after it was broken; that they saw no indication of dry rot, and the pole was in a good, sound condition. It was a white cedar pole, which was the best kind of timber to resist dry rot in this climate, and when placed by the defendant had been examined and selected as suitable for a corner pole. The trial court, in his conclusions of fact, finds that the pole was rotten and unsubstantial at the places where it broke, and that the defects were the cause of the breaking of the pole, when

other poles of less apparent strength were uninjured; and the breaking of the pole by reason of its unfit and rotten condition was the direct and proximate cause of the injury to plaintiff's property. This is not a finding that the pole was so defective as to render it unfit and insufficient, under ordinary conditions, for the purpose for which it was used, and, in view of the undisputed evidence as to the character of the storm in which pole was broken, this finding of fact is insufficient to authorize a judgment in favor of the plaintiff. In our opinion, the evidence fails to show that the pole was insufficient under ordinary conditions, and, had the trial court passed upon this issue, he must have so found. We think it clear that the court below, in rendering judgment for the plaintiff, did so upon the theory that, if the pole was defective to such an extent that it was too weak to withstand the storm of September 8, 1900, when other poles erected by the company did withstand the storm, and that the breaking of the pole caused the damage to plaintiff's property, he was entitled to a judgment, regardless of the character of the storm, or of whether the pole may not have been strong enough to resist the force of an ordinary storm. It is unnecessary to cite authority upon the proposition that if the pole was, under ordinary conditions, suitable and sufficient for the purpose for which it was used, the fact that it was not strong enough to resist a storm of such unusual and unprecedented violence as that in which it was broken, would not show negligence on the part of defendant in using said pole, because defendant was not required to foresee such an occurrence, or to construct its lines with reference to same. The mere fact that it was possible for the defendant to have procured poles of sufficient strength to withstand the storm, as shown by the fact that some of the poles erected by it were not broken by the storm, did not require it to use only poles of sufficient strength to withstand a storm of this character, and its failure to do so was not negligence.

65 S. W. Rep. 1086.

FORFEITURE OF FRANCHISE.

That a system of telephone and telgraph lines and wires has been out of use for a short period, owing to financial difficulties of the company, and for a longer period afterward, by reason of the city's refusal to authorize repairs, is no justification for the city's refusal to permit their lawful restoration, and while it may reasonably prescribe the time and method under which repairs on a system of telephone and telegraph lines shall be made, it cannot adjudge the franchise forfeited by non-user, and absolutely deny the right to do so, and thus, in effect, condemn the company's property and confiscate its franchise.

74 N. Y. Supp. 15.

WIRELESS TELEPHONY.

Now that wireless telegraphy has proven itself practicable, at least within certain distance limits, inventors are at work endeavoring to perfect wireless telephony, says Electricity. In England the system invented by Messrs. Armstrong and Orling is being seriously considered. If the invention does all that is claimed for it, says a cable dispatch, there will be a revolution in the existing system of telephony, which is sadly needed in London, where the telephone system is said to be growing more unsatisfactory every day. It seems that the experiments in wireless telephony recently conducted in Manchester have so impressed the local authorities that they are about to apply for Parliamentary powers to establish a telephonic service in competition with the National Telephone Company.

At Glasgow it is claimed, where a municipal competition service has already been established, the corporation has placed its exchange at the disposal of the inventors in order that the possibilities of the system may be thoroughly tested.

For months past the inventors have been working in a secluded part of Buckinghamshire, perfecting their invention. Demonstrations have been held from time to time before representatives of British and foreign governments. Mr. Armstrong, in a recent interview, is reported as saying:

"The system differs from Mr. Marconi's in essentials. Mr. Marconi has created a force to overcome a resistance. We are utilizing ripples in the electricity of earth or water, which can be created with as much certainty as ripples can be caused in a pond by throwing a stone."

When questioned as to its cost, Mr. Armstrong said that in all probability a subscriber would purchase outright an instrument costing from $25 to $50, and would pay a royalty of $5, $10 or $25, fixed by the municipality or responsible authority.

It is claimed that there is no possibility of reading another person's messages. Each instrument is tuned to a corresponding instrument, and these communicate.

Another inventor engaged in trying to solve the wireless telephony problem is M. Louis Maiche. For this purpose the Prince of Monaco has placed his domain at his disposal.

M. Maiche, who, according to the "Electrical Review," London, is well known for his extensive researches in the domain of telegraphy and telephony, made experiments in the transmission of words and signals on the Morse code by earth currents.

This is briefly the result of the tests with an improvised apparatus and a current of .003 ampere and 8 volts.

1. At 1,500 meters conversation transmitted as distinctly as by the best ordinary telephone system.

2. At 4 km. speech still very distinct, but seeming to have arrived at the limit of perceptible intensity.

3. At 7 km. vibrations of the telephone plate sufficiently distinct to allow of Morse signals being transmitted with the utmost regularity.

The experiments could not be carried further, as this would have taken them beyond the limits of the domain. The transmitting apparatus used by M. Maiche consists, besides the source of electricity, of an improved microphone and an induction coil wound in a special manner. In the case of the transmission of Morse signals, a key and vibrator are substituted for the microphone.

In both cases the receiver was a sensitive telephone.

The connections to earth consisted sometimes of two electrodes immersed in water, and sometimes of electrodes embedded in damp earth. The two electrodes at each station were connected by an insulated wire which formed a basis on which was connected, according as required, the receiver or the transmitter.

As, according to M. Maiche, long-distance experiments alone could show what length of base could correspond to accentuations in the current conveyed. H. R. H. the Prince of Monaco has kindly placed at M. Maiche's disposal his yacht, Princess Alice, and the local resources of the principality for long-distance experiments which will shortly be made in the Mediterranean and between the French and Italian shores. Evidently, as augmentations of current are mentioned, Morse signals will be transmitted, for which the telephone will act as receiver.

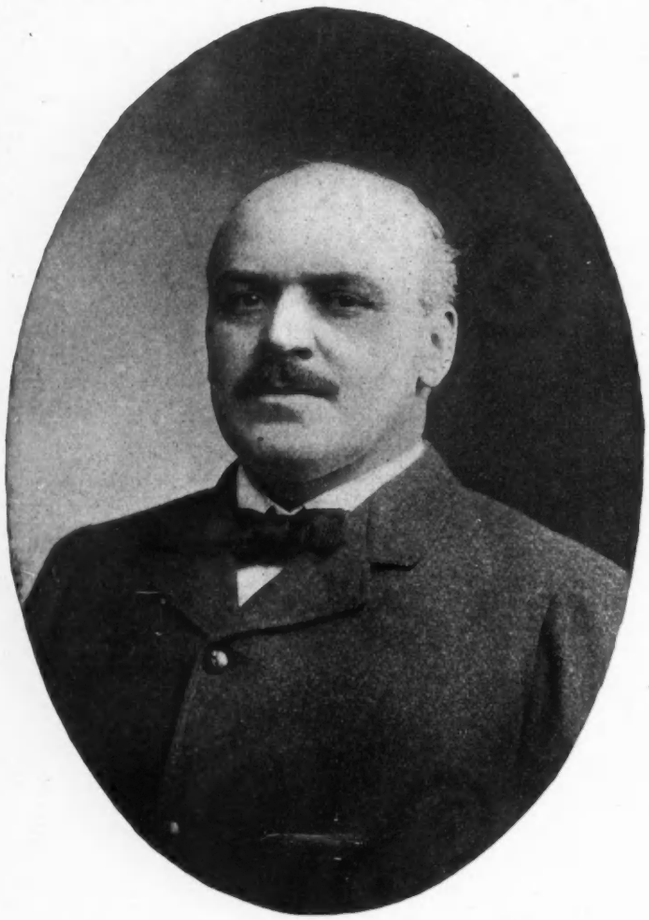
From the above it will readily be seen that inventors are doing all they can to devise a practicable system that will do away with metallic circuit telephones, but it is our opinion that persons holding securities in existing telephone corporations need be in no hurry to dispose of their holdings through a fear of their depreciating at an early date.

A new telephone line, connecting the French and Italian long-distance telephone networks was opened on January 1, when official greetings were exchanged between members of the French and Italian governments. So far the line does not extend into the southern parts of Italy, but only into the northern regions about Milan and Turin; connection with Rome has not yet been completed.

WELL-KNOWN HEADS OF WELL-KNOWN HOUSES.

A BIOGRAPHICAL SKETCH OF H. E. PROCUNIER.

Mr. H. E. Procunier, whose portrait graces this sketch, is the president and controlling factor of the Moon Manufacturing Company, Chicago, manufacturer of the Moon terminal head, which is one of the best known and most widely used terminal heads in the Independent telephone field. Mr. Procunier was born at Port Rowan, Canada, January 29, 1846, and attended the public schools of Canada. He entered the employ of the Sells Manufacturing Company, one of the prominent Canadian engine manufacturers, when he was seventeen years old, serving a four years' apprenticeship, after which he was made superintendent of outside machinery for Gurney, Russell & Co. of Dundas, Canada. He then went with the Jenks Marine Engine Works of Port Huron, Mich., leaving this position to finish



H. E. PROCUNIER.

his studies at the Chicago Athenaeum. After leaving the Athenaeum Mr. Procunier engaged in the manufacturing of engines. Then accepted a position as superintendent of machinery with the Blower Watch Case Company. He then went to St. Louis as assistant master mechanic of the St. Louis, Alton & Terre Haute Railroad, after which he was appointed master mechanic of the St. Louis Ore & Steel Company. He later accepted the position of general master mechanic and master shipbuilder of the Grand Tower & Cape Girardeau Railroad. He resigned this position to take the superintendency of boats for the Consolidated Coal Company at St. Louis, after which he returned to Chicago and accepted the position of superintendent of the American Watch Spring Company. Resigning this position in 1894, he organized and incorporated the Magnetic Telephone Company, the name of which was afterward changed to the Moon Manufacturing Company. Under Mr. Procunier's management this company has made marked progress. The company is probably the largest manufacturer of annunciators in the world. Aside from the manufacture of terminal heads and annunciators, the company makes a specialty of railroad equipment electrical devices, as well as models, dies and light machinery. Mr. Procunier has spent many years in the designing and building of special machinery, and has taken out a great number of patents covering mechanical and electrical devices. While with the St. Louis Ore & Steel Company he erected what are probably the largest blast furnace engines in this country. While with the Grand Tower & Cape Girardeau Railroad he designed and erected an automatic river coal dump at Grand Tower, Ill., which is not surpassed by any similar equipment on the Mississippi river. He also erected the company's shops at Mount Carbon, Ill., which were considered at that time the finest shops in the West. He has the distinction of installing the first air compressing machinery for coal mining in that part of the state. Aside from the Moon Manufacturing Company, Mr. Procunier is the mechanical engineer of the Miller Signal Company, Chicago, besides being interested in other Chicago enterprises. He is a polished gentleman, shrewd and unassuming, and his success is due to his untiring efforts and unimpeachable honor in all his dealings.

A REMINISCENCE OF A. GRAHAM BELL.

BY PHILIP R. FOWLE.

Quite by chance, the other day, I picked up a copy of TELEPHONY for October last, and in running over it my attention was naturally arrested by the article of Mr. Fred. Deland on the incidents and causes which led up to, and the arduous labors attending, the invention of the telephone by Alexander Graham Bell.

It seems to me that one who reads between the lines of Mr. Deland's story will, perforce, arrive at the conclusion that the world-famous inventor of the telephone possesses a most charming personality. And I can assure him that this deduction would become a conviction were he to enjoy the privilege of Professor Bell's acquaintance, and, I might add, the further conviction would fasten itself upon him that the Professor dearly loves his little joke.

The immense popularity the great inventor attained among all classes—scientists, business men and, particularly, his deaf-mute scholars—while teaching in the Horace Mann School at Boston, is a fair index to the lovable character of the man. Of the industry, cheerfulness, patience and loving interest in the welfare of his afflicted pupils tales without number are told and it was due as much to these attributes as to any other one thing that his brother scientists so spontaneously proffered him the aid of the deductions they had drawn from experiments along lines similar to the ones he was following.

All of which suggests a story, a true story, it may be said.

One beautiful day in the late spring of 1880 a youth sat alone in the anteroom of one of the great law firms of the city of Washington. It was the luncheon hour and the members of the firm, as well as the various stenographers and clerks, were gone to the enjoyment of their midday meal. The youth was essaying to do three things at one time—eat his lunch, read Blackstone and "'tend shop."

Now, if there was one thing in the world this young man detested it was the study of law. All his tastes, all his inclinations, ran in widely different channels, but a stern parent with a rooted conviction that he was a Marshall or a Story in embryo, had ordained that he should follow in the footsteps of these worthies, and he was, perforce, endeavoring—with a very sorry grace—to obey the parental injunction.

All that morning workmen had been busy installing a telephone in one corner of the anteroom, and had just completed their work as the noon hour struck. Now, the youth's ruling passion was a love for mechanics in general and electrical science in particular, and it may well be imagined

that during that morning, at least, Blackstone had been relegated to a seat far in the rear, while Bell had monopolized the entire center of the stage.

Before leaving the workmen had carefully schooled the youth in the method of operating the new telephone, though this, indeed, was hardly necessary, for so great had been that young man's interest and inquisitiveness that the harassed mechanics had fallen over him at least twenty times during their morning's work.

When it is remembered that hundreds of thousands of telephones are in use to-day all over this broad land of ours, and that they are skillfully operated, in many cases, by little more than children who fill positions in the operating rooms of the various exchanges, I have no doubt that my readers will smile when I tell them that it was with a feeling of consuming pride that the youth realized—after the workmen had gone—that he, alone, of all that large office force, was the master of the "intricacies" of operating a telephone. That, so far as communicating with another subscriber went, even the head of the firm was, by comparison, as the crawling worm. It was a proud moment, but as the Good Book reminds us, "Pride ever goeth before a fall."

Hardly had the footsteps of the workmen died away in the hall—the anteroom door was open and the stairway in plain view—when the youth heard someone come bounding up the stairs, two steps at a time, it seemed, accompanied by the cheeriest and most musical of baritone voices gaily singing an aria from the Bohemian Girl.

This was quite unusual in these dingy purlieus and argued the approach of an interesting personality not the least trait of which must be courage—it was a dreadfully dark hall. And what a personality it was when it finally burst upon the startled gave of the youth! The latter had dropped his detested Blackstone as the owner of the voice rushed upon him and was staring open-mouthed at a shock of black hair clipped rather short and standing straight up all over a massive head the crown of which was quite six feet two inches above the floor. Beneath the hair rose a noble brow of extreme breadth and depth, below which, again, two shaggy black eyebrows overhung a pair of the most wonderful eyes that were ever looked into—black as night, luminous and seeming to fairly spurt forth sparks of fire. An enormous mop-beard of the same sable hue, and parted in the middle, almost covered the face and served but to accentuate the fierceness of the owner's aspect.

Said the youth to himself: "This is some distinguished Russian who is a client of the firm." His young fancy could suggest no other solution of the stranger's identity.

Withal, there was a breezy, debonair air about the newcomer that went far toward softening the general ferocity of his ensemble. And then—he smiled. Such a smile! It was as if all the merriment and goodfellowship in all the world were embodied in that smile. The youth spontaneously broke into a hearty laugh. The tension was relieved and the relief was a blessed thing.

"Did I scare you, my boy?" asked the visitor. "Well, I didn't intend to; it's just a little way I have, and this glorious weather makes me feel like a boy once more." He was not at all old, scarce thirty-five, the youth thought. "Is Mr. Wilson in?" (Mr. Wilson was the head of the firm) was the next breezy inquiry, with another of those wonderful smiles. "No, sir," answered the youth, "he is at luncheon and won't be back until two o'clock." "Well, well, I am sorry said the stranger; "I have an important appointment at half-past one and it's nearly that now." "Hello!" as his glance fell on the newly installed telephone, "when did you people have that put in?" The youth, with almost an air of proud proprietorship, informed him that the workmen were only gone a few minutes when he came. "Indeed," said the newcomer, with a charming expression of wonder on his face, "do you know they tell me you can talk through that thing and be heard just as plainly as though you were in the same room with the person to whom you were speaking." "Yes, indeed, you can, sir," replied the youth, delighted at the visitor's show of interest and wonder; "I have been talking to Mr. Totten's clerk, Jack Brown —a friend of mine—a number of times since it was put up and I could hear him just as distinctly as though he was in this room." (This was the exact truth; the youth had been keeping the new wire hot.)

"Well, well, well," said the stranger, "now what do you suppose they will be inventing next?" "I'm sure I don't know, sir," said the youth, "but this beats anything I ever saw."

"How do you work the thing?" asked the visitor; "it's pretty difficult to learn, isn't it?" Oh, happiness supreme! This was the request of all others for which the youth had longed—and it had come at last.

With conscious pride he stepped to the new telephone, pressed in the red button (the telephone was one of the earliest make) and turned the handle on the side of the generator. Then he called: "Central!" as was the fashion in those days, and, of course, Mr. Totten's number was next demanded, for "Jack Brown" was there and it was meet that Jack should know he was instructing a distinguished stranger in the mysteries of using the telephone.

"Just step here, sir," said the youth to the visitor, and as the latter complied he handed him the receiver and said: "Now just say something to Jack." The stranger, with a smile, obediently said: "Hello, Jack!" and a moment later was convulsed with laughter at whatever "Jack's" reply was. The youth afterwards found out, but it was then poor comfort to a chastened spirit.

And now the stranger appeared to have no other business on earth than to learn how to operate a telephone. His "important appointment for half-past one" was, apparently, a thing long forgotten.

He handed the receiver back to the youth and insisted that he should receive a course of first lessons. The youth, you may be sure, gladly assumed the rôle of instructor and the lessons began. The visitor was very awkward and the youth thought extremely dull. He simply did not appear to be able to master the business at all, though he apologized all the time for his seeming stupidity and for the trouble he was giving.

After many attempts and much patient instruction on the part of the youth, the stranger at last cried: "I believe I can do it! Let me try once more." Pushing in the red button with one hand he quickly turned the crank on the generator with the other and the youth heard the following conversation: "Hello, Central. Please give me number one." (A pause.) "Hello! Is that you James?" (Answer must be imagined.) "James, just tell the folks that I find it impossible to be home for luncheon; that I have an important appointment with Dr. Johnston; yes, I am now at Mr. Wilson's office learning how to use the telephone. Good-bye."

Then, turning to the youth—who had meantime been growing just a trifle uneasy and suspicious—and with a merry peal of laughter, the big, black stranger made a profound bow and said: "Many thanks, my lad, for your patient instruction; and just see how quickly I have profited by it. I assure you you are a pastmaster in the use of the telephone. At the same time allow me to hand you my card (extending a visiting card). Good-bye and good luck, and again many thanks for all your courtesy."

Saying which, and with another hearty, boyish laugh, he sprang out of the room and down the stairs.

The card bore a single line:

Alexander Graham Bell.

I was the youth.

Gentlemen:—Referring to your inquiry, What shall the word be? as I have had three years' experience in this work allow me to suggest that Phone-a-gram be adopted for a telephone message. Respectfully yours,

W. J. Reisinger,

Telephony.

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EVERETT-MOORE PROSPECTS.

The recent announcement of the sale of the Everett-Moore interests in the Cleveland Electric Railway Company and the Canton-Massillon Electric Railway Company very materially clears up the situation of the syndicate's affairs. It is practically certain that the other large electric railway interests will also be sold outright.

The bankers' committee having the affairs of the syndicate in charge are still making a critical investigation of all the Everett-Moore properties, and are said on excellent authority to have the greatest confidence in the future of the various large telephone companies controlled by the syndicate. It has practically been determined to complete and perfect the larger installations, as the reports received by the committee from the experts who have examined the telephone properties show that the profits already practically assured are sufficient, under careful and conservative management, to place the syndicate once more on a sound financial basis. The bankers' committee and the members of the syndicate are extremely gratified with the showing made by the telephone companies involved and express great confidence in the near adjustment of all the present troubles. It is probable that a bond issue covering the larger telephone properties will shortly be announced. Financial men in Cleveland and elsewhere have expressed their willingness to assist in the floating of such bonds.

Some of the smaller telephone properties of the syndicate will probably be sold outright, owing to the great amount of detail involved in the operation of many small companies, but it is certain that none of the stock in the larger telephone companies owned by the Everett-Moore syndicate will be sold unless very flattering offers, nearly approximating the basis of actual earning power, are made.

The situation is reassuring both to the creditors and to the members of the syndicate, and is especially cheering to telephone men in general. The present outlook is for the rehabilitation of the syndicate's business and credit by the very companies which were at first charged as being the cause of the syndicate's troubles. It would be a matter of congratulation for Independents everywhere if the profits of Federal Telephone and other telephone properties were once more to place the Everett-Moore syndicate on its feet financially, and thereby give the lie to the oft-repeated charges that Independent telephone company stocks are not a good investment. The history of such stocks in recent years should be enough of itself to disprove any such statements, but no greater vindication of Independent telephone company investments could be afforded than the preservation and eventual success of the Everett-Moore telephone properties, a condition which promises shortly to be realized.

Meanwhile, the various creditors of the syndicate are exhibiting a most praiseworthy willingness to lend their assistance in the solution of the Everett-Moore difficulties, the general expression being one of confidence in the future of the syndicate's affairs.

A WESTERN INDEPENDENT ASSOCIATION.

The states of Illinois, Wisconsin, Michigan, Indiana, Kentucky, Missouri and Iowa are all enthusiastically Independent, and now contemplate being even more active in the Independent battle with the Bell, through the formation of the Interstate Independent Telephone Association, a meeting for the organization of which is to be held at the Sherman House, Chicago, on April 9, 10 and 11.

This is a good thing to which every Independent in the seven states mentioned should give his hearty encouragement. Nowhere have Independents found the enemy more resourceful or crafty than in these seven states, but the various state associations have anticipated every move and have checkmated every plan. Now the Independents of seven strong anti-monopoly states are to present a united front to a disorganized and practically defeated enemy. In union there is strength. Nowhere has this old adage been proved more true than in the history of the Independent movement, and any step which means a closer union in the common cause of independence, is deserving of commendation and support.

TELEPHONY, as an Independent telephone journal, welcomes the proposal to form a western Independent telephone association, and pledges its hearty support at all times, to all measures which look to a better and stronger organization of Independents in the great field to be covered by the proposed association.

A western association has many advantages, and means much for Independent progress. The problems of each state overlap into the problems of its neighbors. No artificial boundary line between adjoining states can limit the growth of Independent business. In the building of inter-

state toll lines and in the carrying on of ordinary exchange business, the need of similar laws and harmonious conditions becomes every day more evident, and in the ever-increasing number of telephone exchanges and connections may be read the lesson of preparation for the future.

Not less than the advantages of a united front to the common enemy, and of harmonious conditions in different states, is the advantage of a thorough and enthusiastic invigoration of the whole Independent movement in the West. Many of the problems in the western states are peculiar to that part of the United States, and western men are the best fitted to deal with western conditions and necessities. A convention of delegates from the seven states which propose to organize the new Interstate Independent Telephone Association is sure to be a great success in its enthusiasm for Independent principles, and in practical helpfulness. It is to be hoped that the new association will receive full and complete support from the Independents of the western states.

Chicago, the convention city, is peculiarly fitted to entertain her prospective guests, and all who attend the convention are assured in advance of an enjoyable and instructive experience. The Independent manufacturers of Chicago have united in a determination to make the coming convention the greatest gathering of Independents ever held in Chicago. The ability of the Chicago manufacturers to insure every delegate a good time is well recognized.

One of the features of the convention will be a banquet tendered to those in attendance at the convention, at the expense of various manufacturers. This feature is planned to be a most elaborate and enjoyable part of the convention program. We understand that the committee of arrangements has also provided for other novel features of entertainment; a complete program of addresses by able Independent speakers is also in preparation.

The Sherman House, where the convention is to be held, has made special arrangements to entertain attendants at the convention, and a special rate for all Independents has been secured.

Nothing seems to be in the way of a large and representative attendance, and every Independent company should endeavor to send at least one delegate. The Illinois Independent Telephone Association will also meet at the same time and place and the Wisconsin Independent Telephone Association will attend in a body. Remember the date, April 9, 10 and 11, at the Sherman House, Chicago.

This will be a representative gathering of true Independents. Don't miss it. If you do you will be the loser of much that will be enjoyable and of profit to you.

A SPECIOUS BELL PROPOSAL.

The use of the word "specious" in connection with a Bell proposition to Independents is probably open to criticism. The words "specious" and "Bell," when applied to such a proposition, are practically synonymous. It has yet to be proved that the Bell company ever made a proposition to the Independents in which there was not behind the proffered hand of friendship the poisoned dagger of malicious design. Past history should be sufficient to prove the total fallacy of the idea that the Bell company will ever make an honest proposition to the great and united "opposition" which it hates. In view of this fact it is difficult to believe that the Bell company has any real or sincere faith in the acceptance of its recent offers to furnish Independents with its toll line connections. These offers, made in varied forms in different states, and even to different companies in the same state, substantially agree with each other on one point—they are all made upon the basis of the use by Independents of Bell transmitters and receivers, either without charge or at an annual rental, varying in size according to localities. The offers are also characterized by the usual Bell demand for practically all the profits.

Besides being absurd, the making of such a proposal to the Independent, is an insult. Is it not enough that Independents have been compelled to fight their hard way to liberty in business without their being asked to kiss the hand that spurned them in their weakness and fastened itself on their throats in an attempt to throttle them when they first showed signs of strength? Are all the calumnies, deceits, sharp practices, viturperation and treachery of the last few years to be forgotten? Are Independents to welcome into their house the wolf that would devour them?

The lion and the lamb may lie down in perfect security, so far as the lion is concerned, but the lamb's location in the interior of the lion's anatomy will incapacitate the too confiding sheep for future action.

The Bell company would not offer to Independents the use of its toll line connection if it had not some ulterior design against their independence. The formidable strength of the "opposition" has awakened the former giant to its danger. It has sought vainly for court decisions in its favor, to use as weapons to destroy its foe. It has tried bribery and encouraged treason, only to find the Independent ranks stronger than ever before, and now, when force and bribery have failed, it seeks by strategy to regain the ground which it has lost.

How does it propose to accomplish this? By division in the Independent ranks, sow discord and reap the fruits of discontent. Divide the forces of the enemy and destroy them one by one. That is the simple program, dangerous as it is simple.

It is certain that not all Independents would ever sign the proposed toll line contracts with the Bell company. Therefore there would be a division. The companies which did sign would no longer be Independent, and their defection would weaken the forces of the anti-monopoly army. The Bell would then concentrate the weight of all its money, power and influence in an attack on the companies who would not sign its contracts, being assured that it need fear no danger from such Independents (?) as it had won over to its side. Every resource of fertile Bell ingenuity would be employed. New and shameless tactics would be devised, and in the end, deserted by their former allies, and overcome by the weight of force, the remaining Independents would one by one succumb. We would then have the delectable situation of a "natural monopoly," with its iron hand forever fastened on the public's throat.

To accept the Bell proposal is to lose the support of other Independents, and is a body blow at Independent manufacturers, whose loyal and unswerving support and protection has done much to make Independent telephony possible.

The building of Independent toll lines is the matter of a few years at most. Ever-ready capital, already convinced of the profit to be derived from Independent investments, will soon supply the wherewithal to construct more and better toll lines than the Bell company can ever have. It will pay, having waited this long, to wait a little longer.

As to the proposed Bell contract, let every Independent say, "Away with you, I will have none of it."

RAID ON TELEPHONE COMPANY.

A company was incorporated at Springfield, Ill., last week for the purpose of offering to all telephone subscribers who consider they have been overcharged a chance to participate in the benefits to be derived from Judge Tuley's decison. The company is incorporated as the Chicago Telephone Adjustment Company and its objects are stated as a "general collection business." The head of the company is Wilton B. Judd, an attorney in the Marquette building, and associated with him are M. W. Shanahan and S. S. Howell. It is the plan of the company to take up the cause of all those persons who are not parties to the suit of the Illinois Manufacturers' Association against the telephone company.

Why don't you subscribe for TELEPHONY?

QUESTION AND ANSWER DEPARTMENT.

CONDUCTED BY PAUL M. KRAHMER.

J. F. G.—Will you kindly tell me whether a 1,000 ohm generator series telephone could not be converted into a bridged one that will work all right, especially on short lines, and not too many telephones on a line, by replacing the 80 ohm ringer coil with a 1,000 ohm coil and rewiring in bridge with a push button in place of shunt?

Answer.—Your plan for changing a series generator call telephone to a bridging telephone is a good one. If you work along those lines you will not have any trouble.

J. A. G.—I wished to construct a short telegraph line about, 400 feet long, between two houses and connect in the circuit two ordinary learners' outfits, as usually sold. I strung a single wire between the two houses, secured a good ground on both ends and included in the circuit two gravity cells, but the instruments refused to work. Several expert telegraphers advised me that I could not make such a short line work on a ground, and I was finally compelled to string a complete metallic circuit before I could make the instruments work at all. Now, if you will kindly explain why a short grounded telegraph line cannot be made to work you will greatly oblige.

Answer.—If your two gravity cells are in good condition, stand about point 30 to 35, and your line is 400 feet long, with a set of learners' instruments on each end of the same resistance, and a good ground rod five feet long in the earth, your line will work.

N. T. C.—We have a line of cedar poles carrying one party line wire. The line is 17 miles long. We want to put a toll line on same, and I thought if we could run a metallic circuit using braided weatherproof wire it would give good results.

Answer.—Use cross-arms or brackets. If brackets are used place them on poles 14 inches apart, one on each side of the pole and 14 inches below your grounded party line. If cross-arms are used, place metallic toll line on pins each side of pole. Transfer your grounded party line to either side of toll line. Transpose your toll line each mile. Do not use braided weatherproof wire. Use No. 12 B. B. bare iron wire.

Canadian.—Will you please answer in your "Questions and Answers" where was the first telephone exchange established in America, as you will see by the following paragraphs that authorities differ on the subject. We see in "The Practical Telephone Handbook," by J. Poole, on page 53, under the head of "Telephonic Exchanges:"

"The telephone at first was used almost exclusively for private purposes, but very early it was recognized by Mr. Hubbard, the father-in-law of Professor Bell, that its usefulness would be greatly enhanced by the establishment of telephone exchanges.

"Each member who joined one of these had to pay a certain subscription, for which he was supplied with a set of telephonic instruments and a line of wire which joined him up to a central office where switchboards were fixed and operators in attendance to connect the line of any one subscriber to that of any other one, so that they might converse together.

"The first telephonic exchange was established in Boston, U. S. A., in May, 1877. In this country they were not established until the latter part of 1879, when the invention of the microphone had greatly extended the practical usefulness of the telephone. Very few towns in civilized countries are now without their telephonic exchange, and in most large towns business would be completely disorganized by the cessation of its advantages for a few days."

In the "Practical Information of Telephonist," by T. D. Lockwood, on page 19, we read:

"It is a matter of public history that the first telephone line was constructed early in 1877, between the house at Somerville and the office at Boston of Charles Williams, Jr. This was soon followed by others, and before the end of May, 1877, a practical telephone exchange was operated in Boston by Mr. E. T. Holmes upon his burglar alarm wires. This was the beginning of the telephone office system, the lines of which have now stretched forth through all the earth."

In the Electrical Engineering and Telephone Magazine, August, 1899, page 68, is an article, "The First Telephone Exchange:

"The nucleus of modern telephone service can probably be traced back to the Hartford livery stable, where three progressive physicians had stabled their steeds. During the summer of 1877 this livery was connected by a single iron wire grounded telephone circuit to the office of each of these three physicians, and with the aid of primitive magneto-telephones each physician could direct the liveryman where to send his carriage. The liveryman then conceived the idea of connecting these three lines to a three-way telegraph switch, thereby enabling any two physicians to converse over a completed circuit as soon as the liveryman had moved the switch to the point giving the desired connection. In other words, he established a three-subscriber exchange.

"At that time the manager of the Atlantic and Pacific Telegraph Company's New Haven office was looking for a more desirable district call system than the Western Union Telegraph Company employed. Learning of the Hartford liveryman's scheme, this telegrapher conceived the idea of substituting telephones for district call boxes and connecting the wires to a switchboard so arranged that any two lines could be connected and form a continuous conversational circuit, as the liveryman had done.

"Mr. Morris F. Tyler, a prominent lawyer in New Haven, became identified with the work in its inception and quickly perceived that the telephone traffic would fast outgrow and was far more essential to the public than the district messenger service. So a switchboard was ordered to accommodate fifty subscribers, and on January 28, 1878, the first public telephone exchange in the world was opened for regular service.

"Three days later a public telephone exchange was opened in Meriden, Conn., by Mr. E. B. Baker, and out of these two exchanges has been evolved the comprehensive local and long distance service that has become so essential a factor in the branches of commercial and professional life."—Fred De Land in the Latrobe Advance.

Answer.—The first telephone exchange was installed in the United States in Boston, in May, 1877, by Mr. Hubbard, a relative of Alexander Graham Bell. In the spring of 1878 the first exchange was installed in the city of Chicago.

SEEING BY WIRE.

About every six months there crops up in the newspapers an account of the achievement by someone of a design for visual communication by wire. Almost invariably the inventor resides at the ends of the earth or in the backwoods, says the Electrical Review.

Ever since Professor A. G. Bell devised the photophone and succeeded in transmitting sound impulses over a beam of light, the idea of transmitting pictures or appearances, or light in some form over a wire, has exercised a peculiar fascination upon inventors. It was thought for a long time that the development of the peculiar electrical and absorptive properties of selenium might show a way for the design of such a system. But the further knowledge which has since been obtained of the behavior of this substance does not bear out this view, and it is not now believed that it can be used in this connection.

A number of more or less intelligent methods have appeared from time to time, but so far none of them has met even with the faintest appearance of success, and the subject remains to-day about where it was when it was first thought of fifteen or sixteen years ago. There is no doubt

that such an improvement would be of use could it be made. At the same time it does not to-day appear as if there is any hope for it, and those who put faith in scientific articles in Sunday newspapers are warned to look twice before they believe much in this direction.

BRITISH TELEPHONE NEWS.

FROM OUR LONDON CORRESPONDENT.

The postoffice telephone rates of subscription and its dealings with the National Telephone still absorb much attention, both publicly and departmentally. Apparently recognizing that the recent deputation to the postmaster-general, organized by the London County Council, failed in effecting any tangible result, a conference of the London local authorities, at which all except three were represented, was held soon afterward. A member of the Court of Common Council of the city of London took the chair, and in his remarks emphasized the fact that the published postoffice charges were considered excessive and tended to hinder the general use of the telephone. He was of the opinion that £10 per annum should be the subscription for unlimited service and £3 per annum for the toll system. In proposing this he only echoed a suggestion from a cabinet minister in 1899, at the time of the passing of the act, and, farther, was assured that the National Company was perfectly prepared to reduce its rates to whatever the postoffice did. Many speeches were made as to the disappointment felt and the conference was adjourned, after various resolutions were passed.

General dissatisfaction seems to be felt among the various local bodies, whose districts lie within the London telephone area, that, being a municipal service, they had not been consulted by the postoffice before any decision was arrived at with regard to the tariff. That they have good ground for complaint is evident, inasmuch as the ratable value of this 634 square miles is £50,000,000 and has a population of about six million people, and it is not surprising that efforts are being made for members of Parliament to endeavor to induce the government, which resumes its business on the 16th, to nullify the agreements entered into between the postoffice and the company, and thus open up the way to a reduction as asked for, a reduction which can obviously not be made while the agreements in question are allowed to stand. As an indication of the general feeling, all too likely to have but little effect, it is to be feared, is the following amendment to the address, when the House of Commons meets, which will be moved by Mr. Thos. Lough, M. P.: "We humbly express our regret to your majesty that, having regard to the promises made to this House during the recent Parliament by your majesty's government, and to the report of the committee that inquired into the question, your majesty's government should have entered into an agreement with the National Telephone Company in regard to the telephonic service in the metropolis without giving either to Parliament or to the local authorities in London an opportunity of considering the terms of the said agreement." It is also of importance to note that legal opinion is given that the postmaster-general has acted *ultra vires* as regards certain clauses of the said agreements concerning the jurisdiction of certain streets.

To turn now from the commercial side of this question and come to the more technical, a few particulars of this famous postoffice London exchange will not be out of place. As a matter of fact, four exchanges are now being constructed in the London area, but the most complete is the Central, or the one which will provide for the city pure and simple. The switchboard at this exchange is of the "common battery" type, by which the whole of the magneto generators and batteries in the subscribers' instruments are dispensed with, and the whole of the necessary current derived from one source, viz., the power plant at the main exchange. This is supplied by two motor generators, each with an output of 500 amperes at 30 volts and 650 revolutions per minute. As at Glasgow, air and paper insulated cables are employed and very elaborate arrangements are made for bringing these into the building and carrying them to the top floor, where the exchange room is situated. Each operator has normally to look after 180 subscribers—a rather large number in a busy exchange—but arrangements are made for transferring subscribers' lines from one operator to another should occasion arise. The one important feature of interest is the existence of a large number of meters for recording the calls made by subscribers on the toll system, and by this arrangement such subscribers are debited with each completed call. No account is taken, however, of when each call was made and to whom connection was made. In the other areas party line subscription is allowed, but no such connections will be made at the Central.

Apart from London, quite a number of loans have been granted for the equipment of exchanges on the one hand and licenses to undertake telephony on the other, besides more than one special bill deposited for consideration by Parliament, praying for powers to work in combination the areas of several local bodies. The local government board has granted a loan of £2,000 to Grantham for the establishment of a municipal telephone service, accommodating a ten-mile radius. In this there will be two kinds of service, viz., a local service only and a local service with a trunk connection. For the former the charge has been fixed at £3 and for the latter £6 per annum. This town has been blessed with promises of financial support, not usually associated with telephonic enterprise, for the Earl of Dysart is willing to share any loss up to £50 per annum during the first three years. The initial cost of the exchange is put at £1,560, the remaining £440 of the loan being reserved for probable extensions.

Mr. A. R. Bennett, the manager and engineer to the Glasgow corporation telephone department, would appear to be gradually creating something akin to a monopoly in municipal telephone consulting engineering, for every week sees him advising a new corporation in the capacity of consulting engineer. Among his latest is Brighton, where he has handed in an estimate of £45,000 as sufficing to equip and erect a system capable of dealing with 2,000 subscribers at an average subscription rate of £5-5-0, and also allow of an annual surplus of £1,200. Applications are coming in fast and Mr. Bennett should soon have sufficient material by him in the way of results to effectually silence all his critics as to the cheapness of all his initial first costs.

After practically settling with the National Telephone Company to purchase its Eastbourne business, as mentioned previously in my notes, the Eastbourne Town Council broke off negotiations and are now being advised by Mr. Bennett as to the establishment of a municipal system. The estimate in this case is £13,200, with a £5-17-6 tariff. At Tunbridge Wells there are now nearly 600 subscribers and the rate of increase has necessitated an application to the local government board for a loan of another £15,000. Lincoln and Dundee are among the latest town councils to take up the matter, while Scarborough has engaged Mr. Bennett to advise.

An Independent telephone line will be established between Binghamton and Ithaca, N. Y. President Hubbell of the Independent Telephone Company of Ithaca is quoted as saying: "We hope by that time to have our toll lines complete to Cortland, where we will connect with the local plant, which has about 800 subscribers. Through the Cortland exchange we shall have access to the large Independent plants at Syracuse, Auburn, Rome, Utica, Little Falls and other towns. Our long-distance company will also build a line from Ithaca to Watkins and will connect there with lines already completed from Elmira west to Olean. This will include the large exchange at Elmira with 1,000 subscribers and exchanges at Hornellsville, Wellsville, Belmont and Friendship. We will reach the large Independent exchange at Rochester through Geneva from Watkins, and towns south of Binghamton will be reached by lines running from Elmira to Binghamton."

BRIDGING MAGNETO GENERATORS.*

Once upon a time Phaeton, son of Phœbus Apollo, rashly undertook to drive the Solar Chariot through the heavens. The chariot approached so near the earth that mountains began to blaze, rivers and fountains dried up. Zeus got so enraged that he hurled his thunderbolt at the charioteer, thereby precipitating him into the River Eridanus. There he was found by his sisters Heliades, lamenting long and bitterly. They were at last changed into ever-sighing poplars and their tears, which continued to flow, became translucent amber as they dropped into the stream. Later when the Greeks found this amber they gave it the name of electron, from which the name of electricity is derived.

The principle of this subject, the subject I am to talk about, is somewhat ancient, but it may be new to some. The bridging generator has become of great importance to the Independent telephone companies of this country.

A generator, when at rest, is a mass of steel, copper and iron, which, when the armature is rotated, generates an electric current. In other words, it is a dynamo; it has from three to five permanent magnets, forming a powerful field; it has an armature wound with many turns of silk insulated wire, moving in bearings between the soft iron polar extension of the permanent magnets.

If armatures are placed in vertical position between the permanent magnets, the maximum lines of force pass through the wire, which is wound shuttle-like on the armature and flows from right to left, and as it is turned into horizontal position, the number diminishes to zero, but on continuing the revolution the lines begin to enter the shuttle from the opposite side.

If the armature is turned from right to left during every half revolution, currents flow from the back to the front and in the opposite direction in that part of the shuttle descending from the left to the right. It is seen that when the shuttle stands at 180 degrees there will begin a reversed induction. One end of the wire is insulated and the other end is grounded to the armature, consequently the current is alternating.

To commute these alternating currents into direct currents, a two-part commutator must be applied to one end of the armature, each part of the commutator connected to one end of the armature wire.

The armature in bridging generators should be laminated, that is, consist of many pieces of punchings made of the best grade of Norway sheet steel. The purpose of laminating is to cut off all circulation of current that might be induced, parallel to the armature conductors, which is called eddy currents.

Eddy currents in a magneto generator is more a theory than practice. These parasitic currents are of importance in large dynamos. Lamination on magnetos, however, assure great permeability which cannot be obtained in cast-iron.

The magnets in a bridging magneto should be very carefully constructed, that is, properly bent, so that the ends lie nicely and securely on the polar extensions. They should be tempered with great care in an even heat; every magnet should be tested after magnetizing. The magnetizing is mostly by contact, that is, they are drawn over a powerful pair of electro-magnets three or four times. We found that drawing them over the electro-magnets and reversing the polarity several times makes very strong permanent magnets.

Every detail in the construction of a bridging bell should have careful consideration; the gear wheels to be wide and speed properly proportioned; the shunt of current and positive construction; the air gap of the armature as close as smooth running will permit.

Bridging generators are designed for quality of current, but the voltage must not be overlooked, as in many cases of our systems heavily loaded lines and of long distance, voltage is important, so as to ring the bells on the other end of the line.

The ringer consists of a permanent magnet, two electro-magnets, one armature pivoted in the center and operating before the poles of the electro-magnet. The permanent magnet is again fastened to the heel iron of the electro-magnets. Through this arrangement the electro-magnets become magnetized by contact by one end of the permanent magnet, and the armature becomes magnetized through induction by the other end of the same permanent magnet.

Supposing the upper end of the permanent magnet is north, the armature becomes north through induction. If the lower end of the permanent magnet is south, the electro-magnet becomes south through contact; it follows as long as there is no current passing, the armature is attracted by both poles of the electro-magnets alike. As soon, however, as a current flows around the electro-magnets, one of them becomes north and the other south, and, as unlike poles attract, and like poles repel, the already charged armature will be powerfully attracted by one pole and repelled by the other pole of the electro-magnets. Now, by every half revolution of the armature in the generator, the current polarity is reversed and, consequently, as the action just described, as the reversing of the current, is very rapid, it naturally causes the vibrating effect of the ringer.

In the bridging ringer high retardation and co-efficient or self-induction are necessary. To avoid undue leakage of the voice currents, the electro-magnets are wound to a high resistance, usually 1,600 ohms. The high retardation is obtained by winding the wire on long iron cores of the finest double Norway iron, wound with as many turns of wire as the room for winding will permit. It should, however, be remembered that the turns in the winding is what is wanted and not the resistance. The resistance is incidentally produced.

The adjustment in a bridging ringer should be so arranged that the finest point of adjustment is possible, and, after being adjusted, permanently held in place. A good test for the efficiency of a ringer is to ring the striker on a short circuit, and then suddenly switch in high resistance. If the striker will respond at once without striking you have a good ringer.

A good deal more could be said and written on this subject, which, although not new, I hope has been interesting and has left the impression that the manufacture and handling of bridge generators is by no means a side issue in telephone engineering. Therefore, my advice would be to buy the very best to obtain the best results.

*Paper read by Chas. W. Farr before the Independent Telephone Association of Wisconsin, February 19 and 20.

BEHIND TIME.

"It isn't my fault," declared the bachelor. "I would have been married long ago if the fates hadn't been against me. I simply gave up when I discovered that the race was too swift for me. There was a time when all my future was centered in a certain young lady who lived in this city. But I had a detested rival who caused me a good deal of uneasiness. At last I resolved to settle the matter; so I dressed myself in my best and made for the girl's home. Say, but I was boiling mad when I met my rival at the door. Something told me that he was on the same errand, and we stood there and glared at each other till the mother came to the door and informed us that the young lady had gone to a neighboring town to visit an aunt.

"As I turned away I chanced to notice a hack passing. I knew that there was a train leaving for the town where the girl was in a few minutes, and it gave me an idea. Making a dash for the hack I jumped in and shouted to the driver that I would give him $10 if he would get me to the station in time to catch the train. Then I waved my hand to my rival as long as he was in sight, and chuckled to myself at the success of my coup.

"Well, I arrived at the town, found where my friend

was staying, and called without loss of time, as I had an idea that my rival would be down on the next train

"Say, I hope never to get married if that miserable fellow hadn't called her up by telephone and settled the whole thing before I had even caught my train!"

THE RELATION OF THE MANUFACTURERS TO THE OPERATING COMPANIES.*

The development of Independent telephony in Wisconsin is of peculiar interest, for although Illinois was its cradle, Wisconsin was the birthplace of Independent telephony. It was in the Badger State, at the city of Racine, that this great movement began. We may well be proud of the glorious victories which have followed the first feeble efforts made under humble auspices, and carried on throughout the nation.

In these early days there were many difficulties to overcome which are not a menace to you at present. Companies were organized to operate local telephone exchanges, but there was no place in this country to get the supply of telephone apparatus needed, which, therefore, had to be imported from Canada and other foreign countries. The Western Electric Company (controlled by the Bell company) not only refused to sell telephones or their appliances, but also until recently refused to sell to Independents such ordinary materials as wire, twisted pair, common paraffine and cotton insulated copper wire. Nothing pertaining to the telephone was supplied by the manufacturers of this country, who were intimidated or restrained by Bell monopoly influences. Therefore, in distress and of necessity, in order to obtain switchboards and telephone apparatus, the Independents instituted a manufacturing business which had to protect and defend its product against the aggressions of the Bell monopoly. It was found that the few magneto bell makers and manufacturers of appurtenances alone were not to be depended upon to cope with the Bell methods of stifling competition.

The Independents of Wisconsin owe their existence and safety to the manufacturers. When they have arranged for meetings and conventions, state or national, it is the manufacturers who have come forward and furnished funds for entertainment and have helped defray expenses. The manufacturer and his agent, the supply house, have spent a fair proportion of their profits in making exhibits and sending experts to Independent gatherings, so that telephone buyers might easily examine into new developments in the art and keep posted on up-to-date methods and ideas. Yes, it is the manufacturer who paid the costs of fighting the patent suits and stood between his customers and trouble in the use of apparatus which was both desirable and necessary to success in operating a telephone system.

Your committee has wisely reported against the subtle proposition of the enemy to furnish some of you with transmitters and receivers, and to allow the use of Bell long-distance lines and connection to such as accepted the offer. At present the Bell people are offering the use of their transmitters and receivers "on any old terms," so to speak. Some people are furnished them free; others are charged from $1.25 to $5.00 per annum. If you accept these terms pretty soon they will want you to use their magneto bell and twisted pair wires and other things. Don't do it! Independent manufacturers have their own transmitters and receivers. Your choice is not limited. Everyone claims he has the best. Still there are some people now talking about the standardizing of telephone apparatus, and although we must give them due credit for intelligence, and a knowledge of many of the needs in practice, yet their suggestion is dangerous, for it means drifting in the direction of the monopoly. There are many different kinds of transmitters and receivers in use by the Independents quite good enough to compete with the best the Bell company offers. Then there are many different ideas among the users as to what form suits them best; no one kind suits all, and if you were to pick out the best three or four experts in the business, the chances are that they would select three or four widely different designs as the best to use in the "standardizing" arrangement. The most important thing to Independent buyers, however, is that they support various enterprises, to the end that they may have the benefits of competition and improved qualities and prices of manufacture, through which to give improved service and rates to their patrons.

The important elements in a telephone are the transmitter and receiver. If you take these away you break up the telephone, and if you take them away from the manufacturer you break up the telephone manufacturer and reduce his position to that of the early days, when the Bell people refused to sell us ordinary twisted-pair annunciator wire. We have wire of our own to-day, and we don't need their wire; neither do we need their telephones, for we have improved upon both.

Many operators spend in making devices to save 20 cents to $1, time that would earn them from $1 to $10 if applied in their regular line of work, getting new business, etc. The small profit taken from the manufacturer in such cases lessens his opportunity for helping the operator in other ways. It is better that each apply himself to the aid of the other.

The operating companies should keep in mind where their trade goes; if it goes to the Bell people on transmitters these profits will be used against Independents instead of for them. They must not expect manufacturers to fight patent suits for them and guarantee them suitable working apparatus if they give their trade to other concerns, either Bell or so-called Independents, that lie in wait for their business, but fail to share in the responsibilities and expenses incident to its success. Do not be fooled by the mere offer of free or cheap transmitters and receivers or connections with long-distance lines, any more than by the other inducements of those not known to be loyal and generous in times of need. You cannot expect perfection yet; neither would you be satisfied if you had the limited connections of the Bell company's long-distance lines, for there is every reason to expect that this year will see a great increase in toll line work by the Independents, and, like the "twisted-pairs," we'll have long-distance lines of our own.

There are any number of people from other states coming to Wisconsin this year looking for Independent telephone opportunities. They will supply you with such toll lines as you will not have built by your own citizens. There was a time in your eariler days when the Bell people scorned your requests for connections. You needed them worse then than you do now. So let them keep their monopoly to themselves, and let us keep improving our own conditions instead of helping them, and before two years have passed Wisconsin will have long-distance communications commensurate with its needs and in keeping with its desires of independence.

*Paper read before the Wisconsin Independent Telephone Association, February 20, by J. E. Keelyn.

If there is one enterprise on this earth that a "quitter" should leave severely alone, it is advertising. To make a success of advertising, one must be prepared to stick to it. He should know, before he begins it, that he must spend money. Somebody should tell him, also, that he cannot reap results commensurate with his expenditure early in the game. It is the man who has money to invest profitably, who believes the investment will pay, and then, beginning to spend money, stays in the game to the finish, who makes a success of advertising. Advertising doesn't jerk. It pulls. It begins very gently at first. So gently, in fact, that you would hardly notice it. But the pull is steady. It increases day by day, and year by year, until it finally exerts an irresistible power. It may be likened to a team trying to pull a heavy load. A thousand spasmodic, jerky pulls will not budge the load, while one-half the power exerted in a steady effort will start and keep it moving.—Furniture Journal.

THE U. S. ELECTRIC MANUFACTURING COMPANY.

The U. S. Electric Manufacturing Company is one of the late companies entering the telephone manufacturing field. It was incorporated last June and has been operating its factory at Butler, Pa., since July, 1901.

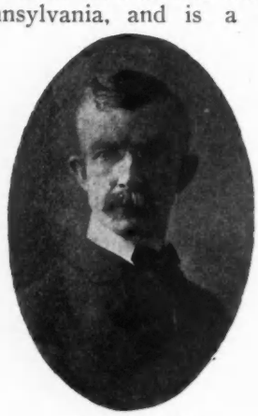
Butler is an enterprising little city of 15,000 inhabi-

J. W. BROWN.

M. A. BERKIMER.

tants, forty miles from Pittsburg, and has direct connection with Buffalo and Cleveland. It is in the heart of the best oil-producing territory in Pennsylvania, and is a very

WILLIAM H. MILLER.



C. A. BAILEY.

wealthy city; has four railroads, giving it excellent railroad facilities.

The officers of the company are: J. W. Brown, president; M. A. Berkimer, vice-president; Wm. H. Miller, secretary; C. A. Bailey, treasurer. J. W. Brown has been a resident of Butler for the past twenty-two years; has been

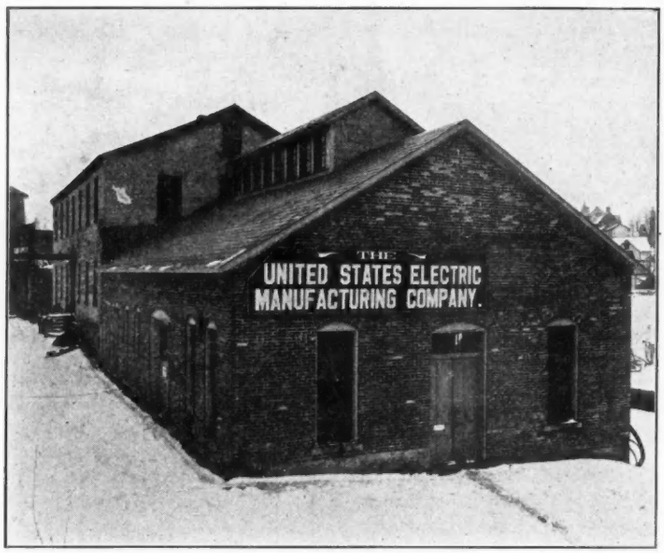
FRED E. FREERS.

F. C. FARRINGTON.

in charge of county affairs for a large part of the time as jury commissioner and prothonotary; also was postmaster of this city; he is now actively engaged looking after the interest of the company exclusively, and firmly believes there is a prosperous future in store for it.

M. A. Berkimer has been a resident of Butler for the past eight years, is one of its prominent citizens and is the leading undertaker of the city; he is also engaged in oil producing, for which this city is so well known; his personal business interests prevent him from taking an active part in the management of the company.

Wm. H. Miller is also a resident of Butler, was formerly engaged in mercantile business, is now engaged in insurance and real estate business and is also secretary of



FACTORY THE UNITED STATES ELECTRIC MANUFACTURING COMPANY.

the Butler Silk Mill, a flourishing industry owned by Butler capitalists.

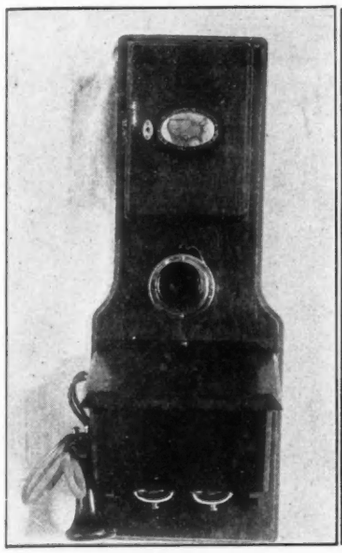
C. A. Bailey has been engaged in the banking business in Butler for the past nineteen years, is now cashier of the Farmers' National Bank of Butler, a new and growing institution, which he helped to organize. Mr. Bailey is a care-

GENERAL OFFICES THE UNITED STATES ELECTRIC MANUFACTURING COMPANY.

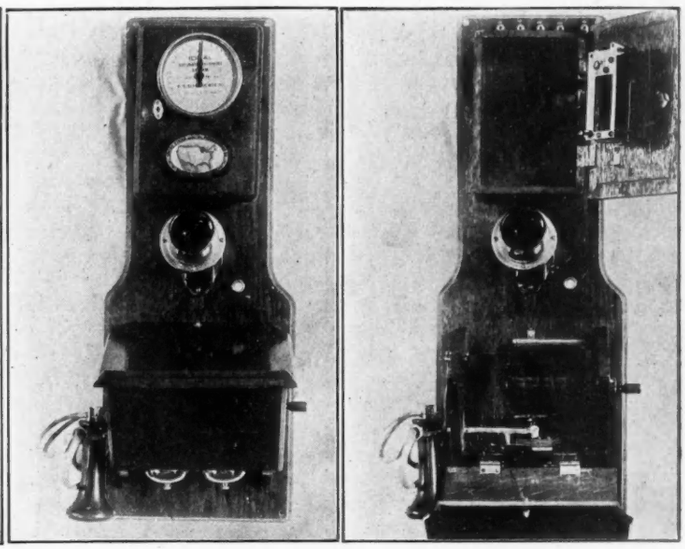
ful and conservative business man and is a firm believer in the success of the U. S. Company.

Fred E. Freers, general superintendent, has been actively engaged in the telephone business almost entirely during the past twelve years; was last with the Pittsburg & Allegheny Telephone Company as superintendent of equipment; prior to that time was engaged in installing switchboards for the Central Union Telephone Company in Indiana.

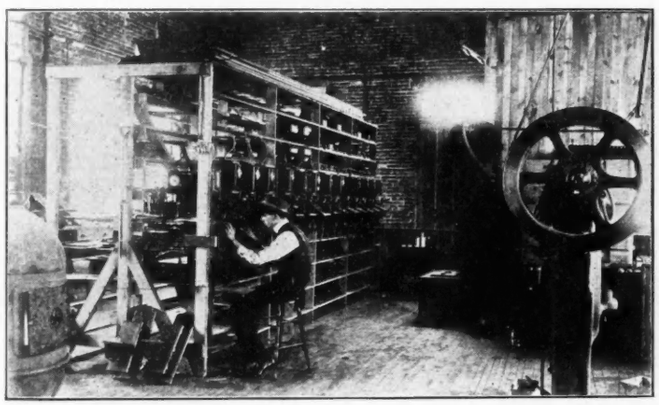
Gordon L. Fowler, superintendent sales department, left the Pittsburg & Allegheny Telephone Company to take his present position; prior to that time he was with Fowler & Sons of Buffalo and Anderson, Ind., as sales agent. Mr. Fowler will be pleased to tell anyone all he knows about telephones in general, and his special line in particular.



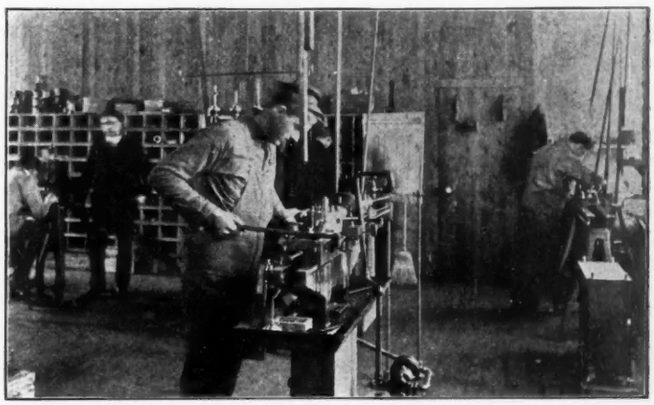
EXCHANGE TYPE SELECTIVE LOCKOUT TELEPHONE.



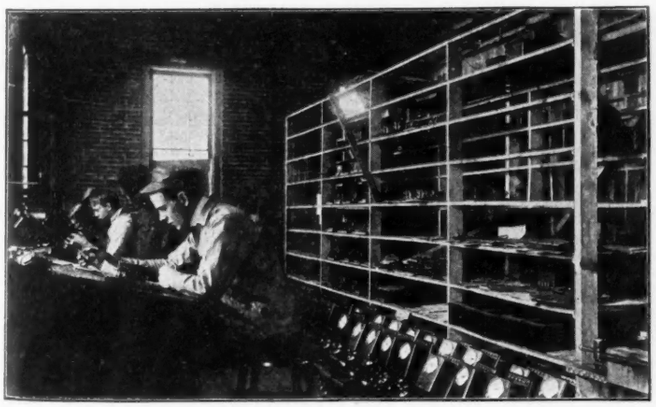
AUTOMATIC EXCHANGE TELEPHONE.



TESTING ROOM, UNITED STATES ELECTRIC MANUFACTURING COMPANY.



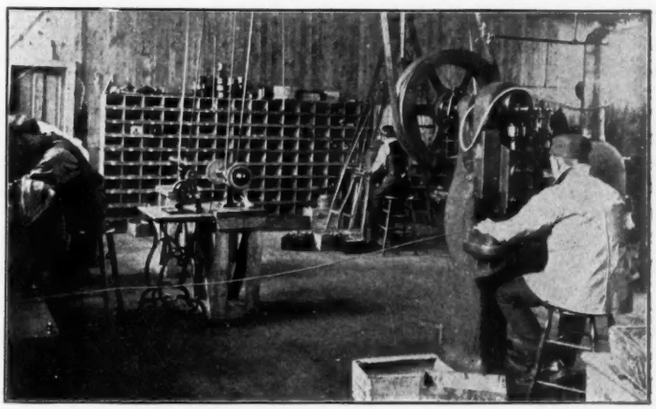
MACHINE SHOP, UNITED STATES ELECTRIC MANUFACTURING COMPANY.



ASSEMBLING ROOM, UNITED STATES ELECTRIC MANUFACTURING COMPANY.

F. C. Farrington, shop superintendent, has had years of experience, starting with the Western Electric Company of Chicago; he is a practical telephone man and is in charge of the machine shop and assembling room.

J. C. Thompson, engineer, is a young man, but has had a great deal of telephone experience in different parts of the country, and is exceptionally well posted on the particular line which this company manufactures.



MACHINE SHOP, UNITED STATES ELECTRIC MANUFACTURING COMPANY.

The factory is a three-story building with a one-story addition. It covers a ground space of 165 by 40 feet and is

conveniently located as regards shipping, being near to all roads out of Butler, of which there are four. The factory is now equipped to supply any demand for U. S. apparatus and it has the room and machinery to handle a large amount of business.

Besides manufacturing the ordinary type of telephone and appliances, the company manufactures an automatic system for operating small exchanges up to 35 subscribers. This is a very simple and inexpensive arrangement, costing but very little more than the ordinary bridging party line, and has none of its inconveniences. It is particularly adapted to farmers' mutual lines, small towns, and is a very good system for intercommunicating systems, as there are no switches to restore when through talking. Hanging up the receiver restores line to normal condition. This system is being well received by factories and the prospect is good for a large business in this line, exclusive of the company's other products.

The company has a number of these systems to install as soon as the weather permits, and is now getting material necessary and is waiting until the weather allows for outside construction.

A selective lock-out party line system for exchange service is also manufactured, which is capable of operating 35 telephones on one circuit. This system operates very satisfactorily and is in operation in several exchanges and is now being installed in more. The company now has two men on the road installing and one traveling salesman. The outlook for business is exceptionally bright at present.

Five patents have been granted covering this selective lock-out and automatic system. The company is preparing to manufacture a new switchboard relay, which is said to be by far the simplest and best acting relay on the market. It is especially adapted for use on central energy systems.

The machine room is equipped with the latest machinery, such as foot and power punch presses, lathes, automatic machines, drill presses, coil winders, etc.

The new 1902 U. S. catalogue will be out in the next ten days or two weeks and will contain about forty pages of interesting reading matter, besides describing their apparatus. It contains illustrated directions for building serviceable telephone lines and also for the care of instruments, locating faults, etc. This catalogue will be sent free upon request.

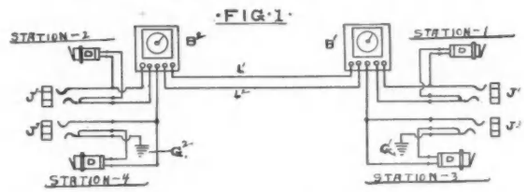
DUPLEX TOLL LINE SYSTEM.

"Toll line busy." This is a familiar term often used by telephone operators, not only on the large toll line systems, but throughout the country exchanges and farmers' lines. The growth of the exchange business has been so rapid that the toll line development has not kept pace with it. For that reason the I. E. S. Duplexer, which has recently been put on the market by the Illinois Electric Specialty Company of Chicago, is something which will interest all telephone men.

By the use of this device a toll line with any number of stations can be used at the same time for a through circuit, affording no inconvenience to the exchange stations and making two complete circuits which can be used simultaneously. Two complete private lines can be made from a metallic toll line of any length without stringing wire or in any way interfering with the existing service. Oftentimes you have a subscriber located a long distance out in the country who wishes a private line, but the distance is so great from the exchange and the cost of stringing a private metallic circuit to this party would be so great that it would be almost impossible to supply his demand, even though you have a line of poles and toll line passing his house. By the use of this duplexer you can put a subscriber in on the toll line and he can be using the line at the same time that parties at either end are using a through toll circuit, and there will be no interference or cross talk.

The method of making three full metallic circuits from two is an old one, yet with the aid of this duplexer, which has a balancing device to balance the resistances of both sides of the line, the service is much improved from the old style.

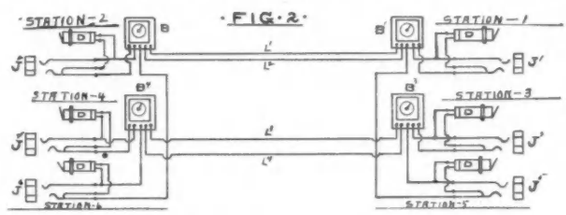
This instrument is contained in a hardwood box about 6 inches long, 4 inches wide and 2 inches high. On its face is a dial and lever. To balance the sides of your line after the instrument is properly connected, this lever is swung



round until it reaches a point where you get perfect silence in your receiver. The line resistance is then equally balanced and this will effectually eliminate cross talk from the circuits.

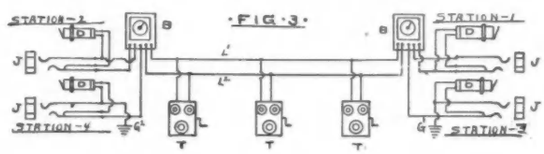
The methods of connecting up the different circuits are illustrated in the cuts shown herewith.

Figure 1 represents the I. E. S. Duplexer connected



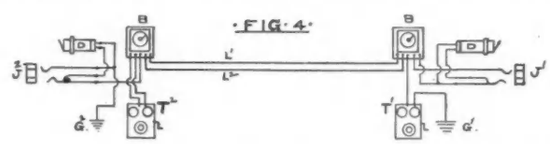
to the wires of a metallic circuit. L 1 and L 2 are the line wires, B 1 and B 2 representing the duplexer. J 1 and J 2 are the original terminals. J 3 and J 4 represent the new circuit.

Figure 2 shows the method of connections for making three metallic circuits out of two. Figure 3 represents a line running between two stations with several intermediate



stations. Connected through this duplexer, it allows of the use of the line between stations 1 and 2, as a through toll line, while at the same time the parties on the intermediate stations can be using the lines, either talking to each other or through stations 1 and 2, without interference.

Figure 4 represents the connections on the switchboard



and through the duplexer to give an intermediate party a private circuit in connection with a through toll line.

This instrument is something that fills a long-felt want in the telephone field and is meeting with much favor where it is in practical operation at the present time. Taken in connection with the many other specialties which are being manufactured by this company, it certainly places them in a position to supply nearly anything which is wanted by the telephone user.

THE ELECTRIC APPLIANCE COMPANY reports a heavy demand for its number 36 cabinet type bridging telephone. This instrument is equipped with a five-magnet generator and is recommended for rural line work.

TRADE NOTES.

HUBBARD & CO., Pittsburg, Pa., will send upon request descriptive matter and net prices on telephone line construction supplies. Correspondence is invited.

THE BELL TELEPHONE MANUFACTURING COMPANY, Baraboo, Wis., is sending to telephone buyers a folder descriptive of the "Bell of Baraboo" and "Baraboo Bell" telephones. It also contains portraits of Mr. W. J. and F. E. Bell, who comprise the company.

THE KELLOGG SWITCHBOARD & SUPPLY COMPANY, Chicago, has opened a branch office in the Keystone Telephone building, Philadelphia, where a full line of samples will be on exhibition. The branch will be in charge of Mr. Paul W. Bossart.

THE SUMTER TELEPHONE MANUFACTURING COMPANY, Sumter, S. C., desires to call attention to its complete line of telephone apparatus. This company manufactures its entire product in its own plant, which is one of the best equipped and most modern in the country.

THE ILLINOIS ELECTRIC COMPANY, Chicago, has issued a very handsome edition of the national electrical code. It is a publication of over one hundred pages and is complete and comprehensive. It will be mailed postpaid to any address in the world provided this publication is mentioned.

THE VARLEY DUPLEX MAGNET COMPANY, Philipsdale, R. I., and Chicago, is sending to the trade a book on electro-magnets. The book is of considerable value to telephone men. It contains many tables and much information of interest. It will be sent upon request by addressing the western office of the company, 82 Lake street, Chicago.

THE GREEN TELEPHONE & ELECTRIC MANUFACTURING COMPANY, Milwaukee, Wis., has placed on the market a line of telephone apparatus which is claimed to possess many points of merit. The company desires to correspond with prospective purchasers and will send descriptive matter pertaining to its complete line of equipment upon request.

THE VARLEY DUPLEX MAGNET COMPANY, 82 Lake street, Chicago, has on hand ready for immediate shipment standard induction coils of various resistances, and can make on short notice ringer magnets, switchboard magnets and other coils for any make of telephone apparatus. Repair orders from exchanges are solicited and will be given prompt and careful attention.

THE INTERNATIONAL SPECIALTY COMPANY, New York, Chicago and Atlanta, has just published a new book on rural telephone lines and telephone troubles, which is an invaluable book to every telephone man. The regular price of this book is fifty cents, but the company will send it free to anyone in the world up to April 15, provided TELEPHONY is mentioned.

THE CHASE-SHAWMUT COMPANY, Boston, Mass., announces that it has secured large and commodious quarters, and is now manufacturing a full line of fuse wire, fuse links and inclosed fuses, rail bonds, junction boxes, nipples, couplings and cables clips. It states that it is now in a position to make prompt deliveries, having fully recovered from its recent loss by fire.

THE MALTBY LUMBER COMPANY, Bay City, Mich., has just issued a booklet on poles, containing the Northwestern Cedarman's rules and comments thereon, which is of interest to every buyer of cedar product. The Maltby Lumber Company has pole yards at Boyne Falls, Mich., on the Grand Rapids & Indiana Railroad; at Pinconning, Mich., where there are two competing roads to furnish cars, and at River Rouge, a suburb of Detroit, with its many trunk lines. The company has competent and trained inspectors at each yard to see personally to the count and grade of stock of every car shipped and guarantee the inspection to be strictly according to the Northwestern Cedarman's rules, governing cedar poles. The company invites correspondence and will gladly send the above booklet upon request if TELEPHONY is mentioned.

THE CENTRAL ELECTRIC COMPANY, Chicago, is prepared to send upon application circular matter fully describing the company's loud-ringing extension bell. This bell is especially desirable for telephone service where the instruments are placed in factories and other noisy places. They are mounted on hardwood bases with nickel-plated trimmings, which make them adaptable for use in offices where a bell of neat appearance is desired.

THE COUNTRY HOME TELEPHONE COMPANY, Chicago, has issued Catalogue "C," which illustrates and describes the company's full line of telephone apparatus. Some space is given to the "Bull Dog" guy anchor and other specialties manufactured by the company. On the back cover of the catalogue is a verse, "Remember our telephone points, no flexible wires, no movable joints." The catalogue will be sent postpaid upon request.

THE AMERICAN ELECTRIC FUSE COMPANY, Chicago, New York and Atlanta, has removed its Chicago offices and warerooms from 345 South Canal street to 48-50 West Jackson boulevard, where the company will have larger and more commodious quarters. One of the features will be a special reception room for customers, where mail may be received, and where a complete file of telephone and electrical papers will be kept. Telephone men visiting Chicago are cordially invited to make their headquarters at the company's new place of business, which is in the heart of the telephone district.

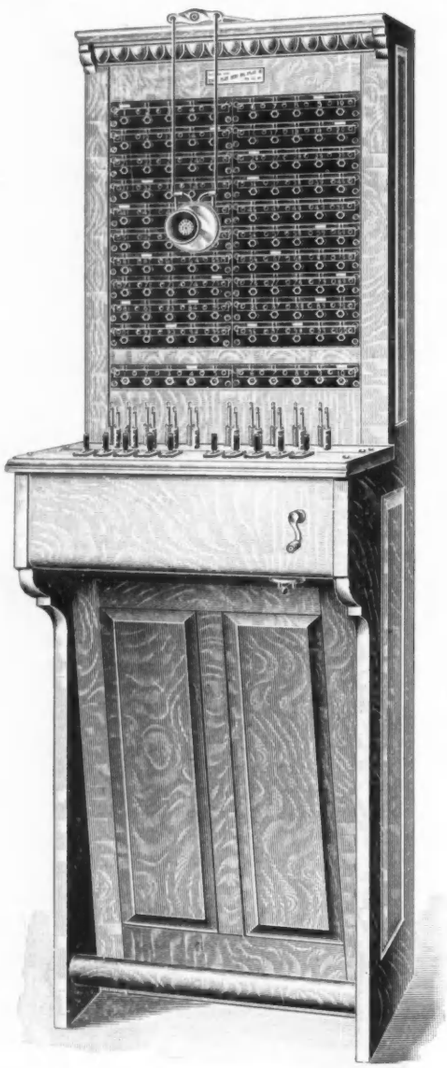
THE STANDARD TELEPHONE & ELECTRIC COMPANY, Madison, Wis., will shortly place on the market its new improved switchboard, which, for simplicity, quickness in operation, finish and general good qualities, it is claimed, will make it one of the best switchboards that has been furnished so far for exchange use. The "Standard" is also designing a new toll and farmers' line switchboard, which will be simple in construction, effective in operation and will be sold at a reasonable price. The "Standard's" South American and Mexican export business has increased to quite a respectable size within the past two months. It expects to furnish apparatus to thoroughly equip exchanges in Colombia, S. A., and Chihuahua, Mexico, during the next thirty days. Orders for telephones and switchboards during February show an increase over the corresponding period of 1901, and orders already booked and prospective indicate a large business as soon as the weather will permit of new construction and extension of lines already built.

THE HAINES & NOYES COMPANY, Chicago, through its private telephone plant department, has closed during the past month the following contracts: Hotel Fremont, California, 130-drop switchboard and 130 telephones; Conservative Life building, Los Angeles, Cal., 90-drop switchboard and 90 telephones; Evanston, Ill., a 35-number apartment telephone system; the new high school, Chicago, a 25-number system; Marsh & Uhlman, Chicago, intercommunicating system of 17 hand microphones; the Globe-Wernicke Company, Chicago, a large intercommunicating system; through the company's agents in Los Angeles, Woodill & Hulse Electric Company, 20 intercommunicating systems have been installed in Los Angeles and surrounding territory; through the John M. Klein Electric Company, San Francisco, a 36-number telephone system has been sold to the government for the navy yard at Puget Sound. The company has also closed contracts for 10 apartment telephone systems in Chicago, and is also equipping St. Anthony's Hospital, Chicago, and the J. S. Ford-Johnson chair factory at Michigan City, Ind.

EACO VISUAL SIGNAL SWITCHBOARD.

The Eaco visual signal switchboard is manufactured by the Electric Appliance Company, Chicago, and is claimed to possess many points of superiority. In a circuar describing the switchboard the company says:

"We believe there will be a large sale for the Eaco visual signal telephone switchboard, because it is designed without the use of the old type drop or falling shutter and is constructed with what is known as the visual signal. This signal entirely displaces the old style drop or falling shutter, and not only makes the work of the operator more



100 NUMBER. VISUAL SIGNAL SWITCHBOARD.

positive but absolutely sure, and greatly facilitates her work, thus gaining two points of great importance, accuracy and saving of time.

"The visual signal appears, when a subscriber calls, as a bright indicator, and locks until the operator answers the call by plugging in, which releases the indicator, when the signal immediately disappears.

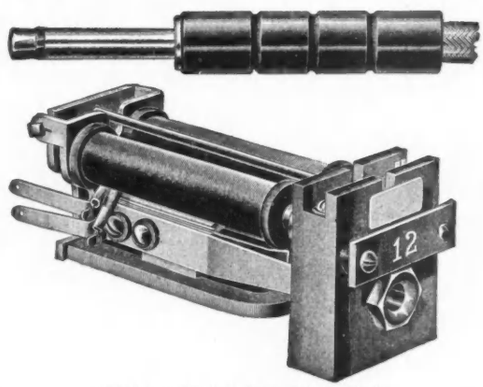
"The signal cannot disappear unless the operator answers the call. The signal cannot appear unless the subscriber calls. A sudden jar of the board will not cause a number to indicate as by the use of the old style drop.

"The jack and signal are self-contained and self-restoring, and are mounted five on a strip which measures 8¼ inches by 1⅝ inches.

"Any Eaco jack and line signal combined, which we term 'visual line equipment,' can be removed from the switchboard separately and independently of any other line equipment by the simple method of removing the nut which acts as the jack bushing on the front of board and taking the target off the armature rod, then pull the line equipment out from the back of the board; or a full strip of five-line equipments may be removed by taking out the four screws which fasten it to the cabinet and pull the full strip forward.

"When the line equipment is removed from the board the signal coils may be removed by simply unsoldering the leading-in wire and pulling coils out endways. The armature remains adjusted in the line equipment and the removing of the coils does not in any way interfere with the armature, which stays in position. This is a point of advantage over other makes of self-restoring boards. The simplicity of the Eaco jack is evidenced by the fact that but two springs are used in its construction.

"The locking device of the visual signal is new and novel, there being no cams, weights, springs or triggers of any sort used. A small, permanent horseshoe magnet is fastened to the bottom of the jack in such position that when the armature is attracted by the line coils or electro-magnets it sticks or freezes to the permanent magnet and holds the target or indicator in view until the call is answered and a plug is inserted in the jack. The plug engages a plunger in the jack, which in turn pushes the armature



VISUAL SIGNAL LINE EQUIPMENT.

away from the permanent magnet and restores the signal to its former position.

"The clearing out drops are of the tubular, armored type, and are wound to a resistance of 500 ohms, which insures a sensitive and positive action.

"The ringing and listening key has its own peculiar advantages. It is provided with platinum contacts throughout and when mounted on the switchboard is entirely dust proof. The plug is so constructed that no brass parts are exposed on the outside, making it impossible for the operator to receive a shock. The sleeve of this plug is grooved on the outside and is made from tough black fiber and is well polished. This sleeve screws onto the body of the plug and is not fastened with a machine screw from the outside as is the usual custom.

"The Eaco switchboard is mounted in a case made from selected quarter-sawed oak and each case is given a piano finish. It is constructed of seasoned wood and is a handsome piece of furniture.

"The switchboard is free from infringements and users are guaranteed against possible interference.

"The Eaco self-restoring combined jack and visual signal are combined in such forms that the signal coils, of which there are two, can be easily removed without taking any of the other parts out. Being a twin polar signal it is built on the best magnetic principle, having both poles in direct magnetic circuit with the armature.

"The jacks and signals are mounted on black fiber, finished dull or dead black.

"The night bell circuit is closed automatically when the signal is placed in the switchboard, no additional connections being required for this circuit.

"The metal used in the line springs is of the best German silver, all other metal parts being hard brass with the exception of the armature, which is soft Norway iron.

"The simplicity of the mechanical as well as the electrical features of this combined signal and jack readily appeals to the practical telephone man.

"The signal, as is shown in cut, is in a position showing that the subscriber wishes to be answered. All parts of this combined signal and jack are removable and interchangeable.

"A special jack is provided for the operator which automatically cuts out the transmitter battery when the plug which is attached to the cord of the head receiver is removed.

"The hand generator is equipped with a special device which, when not in use, closes the power generator circuit."

THE KELLOGG SWITCHBOARD AND SUPPLY COMPANY, Chicago, has just closed a contract with the Rensselaer Telephone Company, Troy, N. Y., for one of its "major" relay type switchboards of 3,000 lines capacity, with a present capacity of 1,500 lines. Included in this contract is all necessary power apparatus, chief operator's desk, wire chief's desk and a toll board of 100 lines capacity with present equipment of 40 lines. These people want the very best as well as most reliable apparatus, which is shown by the fact that they will not rely wholly upon the city power for their source of current, but will install a gas engine as a reserve in case of any trouble with the city

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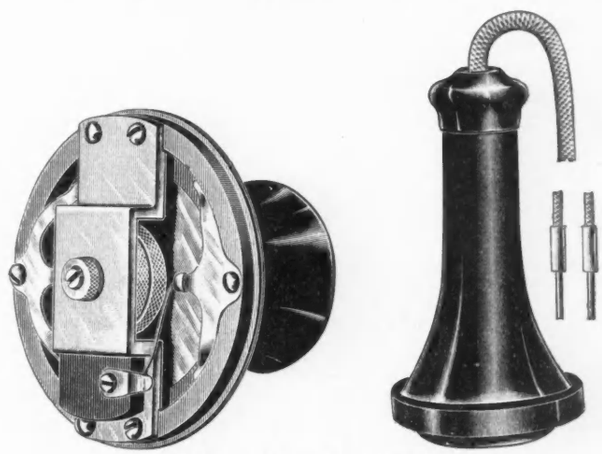
A NEW MANUFACTURING ENTERPRISE.

The National Telephone Specialty Company, 157-159 South Canal street, Chicago, has recently been incorporated to manufacture telephone apparatus, including telephones, switchboards and general exchange appliances. The officers of the company are: Max Rosenow, president; Herbert Rosenow, secretary, and W. R. Shaw, treasurer and general manager. The company is in its new factory, which has been equipped with modern machinery throughout, and is situated in the heart of the Independent telephone manufacturing district. The company begins business with the avowed intention of manufacturing only high-grade apparatus and of giving its customers full value.

MAX ROSENOW.

The accompanying half-tones show the different officers and directors of the company. Mr. Max Rosenow, while practically unknown in the telephone field, is well known in Chicago financial circles, being vice-president and general manager of the National Cooperage & Wooden Ware Company. Mr. Herbert Rosenow has been associated with the Eureka Electric Company of Chicago, Ill. During his experience there he has derived much valuable knowledge as to the requirements of the telephone trade and fully realizes that in order to be successful it is absolutely necessary to furnish nothing but the highest grade apparatus at the most reasonable price possible. Mr. W. R. Shaw, who is the treasurer and general manager of the company, was also formerly associated with the Eureka Electric Company. For the National Telephone Specialty Company Mr. Shaw has perfected a solid-back transmitter which is claimed to be absolutely correct mechanically, electrically and phonetically. He has also perfected a receiver which is absolutely self-contained and interlocking, as shown by the accompanying cut. The removal of the cap in no way affects the talking qualities of the receiver; in fact, you can remove the whole shell from the receiver without in any way disturbing the mechanism, and, as far as transmission of tone is concerned, it will have the same qualities as before. Cut of the company's transmitter is also shown, which illustrates fully the different parts. The company intends using nothing but the Holtzer-Cabot generators and magnetos in the assembling of its telephones, and say that they will make prices which will be attractive to any parties who are interested in high-grade telephones. Besides the company's present line of apparatus, it has a number of improvements bearing on central battery instruments. It refers any parties interested to the advertisement shown in another part of this journal. Correspondence from prospective purchasers of telephone equipment is requested.

WILLIAM R. SHAW.



NATIONAL TRANSMITTER AND RECEIVER.

HERBERT ROSENOW.

THE SUMTER TELEPHONE MANUFACTURING COMPANY.

The following item concerning a prominent telephone manufacturing company of the South is taken from a recent issue of the Manufacturers' Record, and shows the splendid appointment of the Sumter factory. This company has an exhibit of its complete line of apparatus at the Charleston Exposition, the inspection of which is invited. The item follows:

"A manufacturing enterprise of the South that is attracting considerable attention is that of the Sumter Telephone Manufacturing Company, located at Sumter, S. C. It has a very complete factory equipment, and makes practically everything entering into the construction of its large line of apparatus. Its machinery department is completely furnished with the latest and best types of machines, including many automatic and labor-saving tools. The main factory building is 470 feet long, there being 30,000 square feet of floor space, and the arrangements of departments is such that each is separate and distinct. Large sub-die and punching power presses are used for the stamping of all metal parts, and for the manufacture of tools, dies, etc., there is a perfectly equipped toolmaking department. A feature of the Sumter instruments is the magnificent finish

given the woodwork. The wood is sawed by the company's own bandsaw mill, and all wood parts are manufactured right from the log. The Sumter Telephone Manufacturing Company is turning out a line of telephones adapted to either local or long-distance service. It has equipped a large number of exchanges throughout the middle and southern states and its business is rapidly increasing and extending to all parts of the United States and several foreign countries. The officers are: Col. R. M. Wallace, president; Mr. C. T. Mason, vice-president; Mr. F. C. Manning, secretary, and Mr. C. G. Rowland, treasurer.

FRENCH TELEPHONE RULES.

It is stated from Paris that new regulations issued for telephone girls are causing endless amusement. One clause forbids their ever calling subscribers to converse with them. Another forbids them to answer flatteries, compliments or pleasantries from men subscribers. Juliette Adamson, an American girl, has just been fined $40 for insulting over the wire a tradesman who failed to deliver goods at the promised time. Her defending attorney argued that as long as a subscriber paid the state could not restrict conversation, but the judge held that the state has the right to enforce an order regarding telephones just as it has regarding streets.

INTERNATIONAL TELEPHONE MANUFACTURING COMPANY.

The International Telephone Manufacturing Company, Chicago, has practically completed a full set of special tools and machinery necessary for manufacturing

HENRY SHAFER.

the various parts of the company's central energy multiple switchboard, which embodies many improvements. Within a very short time the company will have its complete line of telephone apparatus ready for the market. Rapid progress is being made on an order for a 1,000-line lamp signal, double supervisory central energy switchboard, and telephones which will be put in operation in the very near future. The company is now selling its new patented ringing and listening key to other telephone manufacturers, as well as

W. E. M'CORMICK.

J. C. BURMEISTER.

to many exchange companies. This key can be mounted on any make of switchboard, and the company claims one manufacturer has adopted the International key, to be used exclusively on all switchboards sold by his company. President Shafer of the International company is one of the well-known figures in the Independent telephone manufacturing

R. N. STITES.

D. A. CLITHERO.

field. His portrait graces this column, as well as the portraits of the other officers of the company. The officers of the company are: Henry Shafer, president; W. E. McCormick, vice-president; J. C. Burmeister, secretary; R. N. Stites, treasurer, and D. A. Clithero, general counsel.

THE KELLOGG SWITCHBOARD AND SUPPLY COMPANY, Chicago, has just closed a contract with the Cass County Telephone Construction Company of South Bend, Ind., for a central energy "major" relay type switchboard of 4,000 lines capacity, with a possibility of 7,200 lines. Its present capacity will consist of 1,500 lines. Included in this contract is all necessary power apparatus, arresters, frames, etc., and 100 standard central energy telephones; a toll board of 50 lines capacity, with a present equipment of 25 lines. The company intends making this one of the most important toll lines in the West, giving service direct from Chicago to New York. At present the company will install 1,000 telephones and additional instruments will be delivered as required.

The outside construction in general will be first class in all respects. All of the downtown district will have an underground conduit system. The whole plant will have the most modern as well as economical devices throughout. The owners of the system have taken an unusual amount of pride in its welfare and will do all in their power to make it one of the most up-to-date plants in the country,

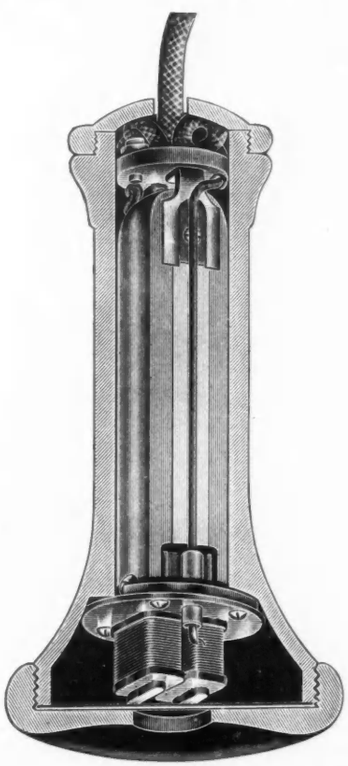
and for this reason have bought the switchboard obtained and will use the best material throughout.

The Kellogg Switchboard and Supply Company also report having been awarded a contract for an extension on the Logansport, Ind., exchange before it was completed and ready for operation, which proves the satisfaction of the company with their switchboard as well as their ability to secure favors from the citizens of Logansport.

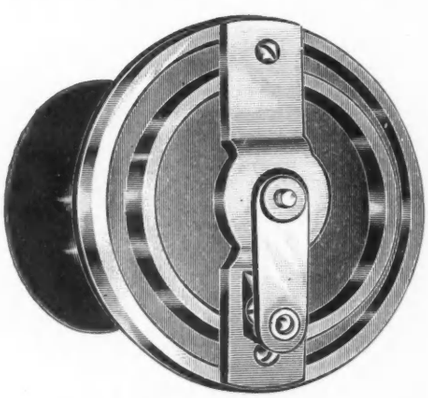
As regards the telephone interests in Logansport, it might be well to note that the Central Union Telephone Company is operating at Logansport without a franchise and the merchants there have decided to use only one telephone—that of the Independent company.

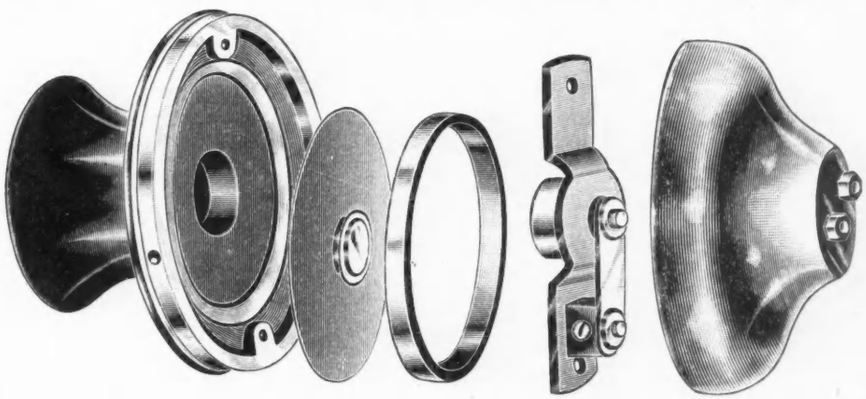
NEW CHICAGO APPARATUS.

The Chicago Telephone Supply Company has just placed on the market its new intensifying transmitter; also a new receiver. The transmitter, which is said to possess many points of superiority over other transmitters, has a solid cast front with turned recess for diaphragm; a heavy brass ring holds the metal diaphragm firmly and evenly in



place. The electrodes are very small and are made entirely of metal, gold plated. No carbon is used except a very small quantity of granular carbon to vary the pressure between the electrodes. "This transmitter," the company says, "is the result of exhaustive experiments in practical work, and its present perfect form is due in a great measure to the kindness and assistance of a number of exchange and toll line managers who have permitted us to give the most thorough tests of time and service to the electrical and mechanical features." The receiver is assembled completely before being placed in the shell. The parts may be released from shell by removing four screws. As the magnet is fastened to the shell at its end nearest the coils, there is no chance for the temperature to change the adjustment. The poles are ground to guage before being placed in the shell, thus insuring the most exact uniformity. The cord is attached in such a manner that no weight falls on the conductor. The cord may be removed by unscrewing the cap at rear end of shell. So far as the general appearance of the receiver is concerned it is built upon the latest and most fashionable lines.





The Chicago Telephone Supply Company has published the third edition of its "Bridging Book." This edition is 15,000 copies, making a total of 45,000 copies of the book issued. This is probably the largest number printed of any similar book in the telephone field. The book is a valuable one and is sent free upon request.

A new publication is shortly to be placed before the mercantile public by the firm of Lewis, Scribner & Co., 125 East Twenty-third street, New York. It is to be entitled "Foreign Trade Requirements." It seems to us to be of so much importance as to deserve special mention, and we desire to call the attention of all manufacturers and merchants interested in the export trade to this new work. For new it is in every sense of the word. It is destined to cover, in the completest possible manner, a field which has scarcely been touched before. Information as to all branches of foreign trade will be placed before the exporter in the most comprehensive form. Every detail that could possibly be of interest will be treated, each section being written by an expert who has personal knowledge of what he writes.

Among other subjects that will be dealt with may be mentioned commercial law, credit customs, patent and trademark laws, traveling salesmen, foreign agencies, advertising abroad, transportation facilities and encylcopedia of commercial cities. All that the exporter has desired to know and which has frequently cost so much time and money to obtain, will be found within the covers of this valuable work.

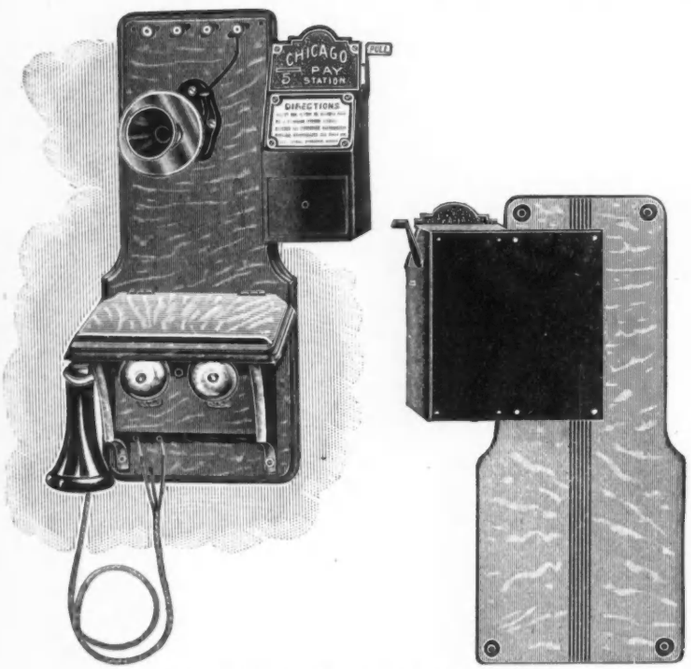
To be forewarned is to be forearmed. For instance, if a firm desires to send a traveling salesman to some foreign country, is it not of vital importance to know the laws and customs of that country in regard to traveling salesmen? With this knowledge, mistakes that might involve large losses can be avoided. But this is only one point in question. Many others might be cited. We are confident that "Foreign Trade Requirements" will be found to be of inestimable value to all interested in exporting, and will fill a long-felt want. The book will be ready for distribution early in April.

A NOVEL IDEA.

Evidently the Chicago Pay Station Company of Chicago, Ill., has thoroughly studied all the problems connected with the coin collector device business. Time was when exchange managers objected to coin boxes on account of the difficulty encountered in attaching them to the telephone. It was either necessary to make a special telephone backboard or to move the transmitter to one side. If neither one of the methods was employed it became necessary to make the coin drawer in the pay station so small that it would not hold enough coins to make it practical.

This has been overcome in a unique way by the Chicago Pay Station Company.

With its pay stations it furnishes for a very slight additional charge what is called a mounting plate. This is made of iron and the pay station is securely fastened to



CHICAGO PAY STATION COMPANY DEVICE.

one end of it by means of four machine screws, so placed that they cannot be removed by anyone unless he has the combination of the lock on the coin drawer. The other end of the plate is fastened by screws to the telephone backboard.

The accompanying cuts showing both the front and the rear view will fully explain this arrangement.

Time, study and money have been freely spent by the company to overcome all obstacles in the way of successful operation of pay stations. If the exchange managers will give a little time to the investigation of the merits claimed by them for their machines it will undoubtedly pay.

WILLIAM J. BELL.

Mr. William J. Bell, Baraboo, Wis., is widely known throughout the Northwest, having been actively engaged in the electrical business for the past twenty-two years. Mr. Bell is prominently identified with the Independent interests in this section of the country, and is the head of the Bell Telephone Manufacturing Company of Baraboo; he is also a member of the executive committee of the Wisconsin Independent Telephone Association.

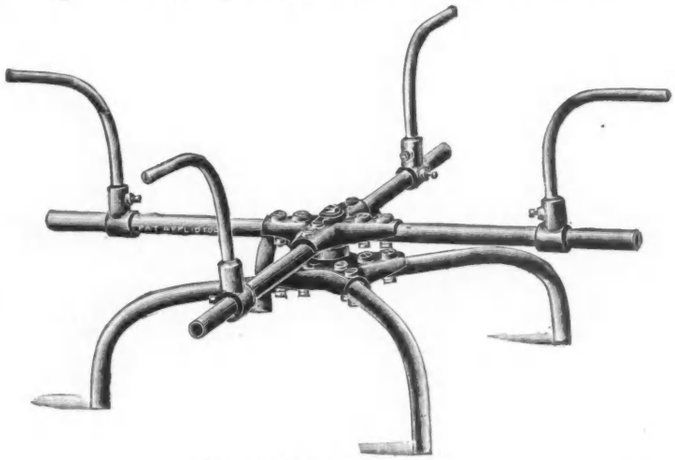
Mr. Bell is not only well known as a business man, but has devised numerous novelties in the telephone field, one being a patent telephone directory, which works upon rollers and springs after the fashion of a window shade, and is placed in the battery box or cabinet receptacle outside the telephone; upon a comparatively small space six or eight hundred names may be placed. This has proved a very convenient and efficient device.

Mr. Bell is now constructing a plant in competition to the Bell in New Decatur, Ala. At different times he has been called as an expert before medical bodies. He has organized many companies, all of which have been financial successes.

READY PAY OUT REELS.

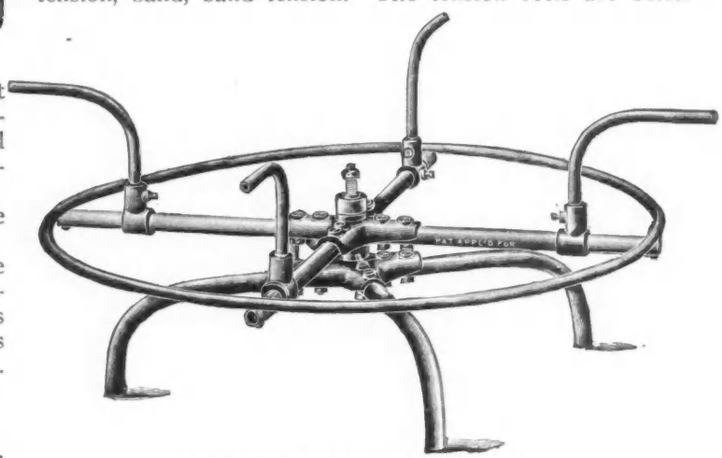
The last few years have witnessed gigantic strides in the telephone field, especially in the apparatus used, while construction tools have improved but little.

The W. G. Nagle Electric Company of Toledo have recently put on the market a reel unique in design, combining durability and adaptability to the conditions to which



READY PLAIN PAY OUT REEL.

these reels are subjected. These reels are made entirely of iron with all parts interchangeable, having cone bearings, which precludes the possibility of the reels becoming wabbly, thus insuring the paying out of the wire evenly, reducing the possibility of the wires breaking to a minimum. The reels are made at present in four styles: Plain, plain tension, band, band tension. The tension reels are better



RELAY BAND TENSION PAY OUT REEL.

adapted for telephone work, as the tension or drag attachment allows of the regulating of the speed of the reel, bringing the reel to a stop as soon as the lineman ceases to pull on the wire. This attachment will be readily appreciated by all linemen who have had trouble with wires paying out too freely and becoming entangled with the other reels. The reels without tension attachment are better adapted for use with heavy wires, such as messenger, large electric light and street railway wires. The W. G. Nagel Electric Company invites correspondence and will send upon request full information and prices on reels as well as on its complete line of telephone and electrical supplies.

A REMARKABLE CHINAMAN.

Occasionally we see articles in the various telephone and telegraph journals extolling some Chinaman for his wonderful ability as a telegraph or telephone manipulator. Some of these articles go so far as to state that some particular Chinaman, by name of Ah Sing, had become so proficient in the telegraphic art that he could recognize the call of the office at the station where he was employed as chief cook, but as to how much farther his ability went in this direction it is not said.

The particular Chinaman of whom I wish to make mention was born in the province of Hong Kong and is now about thirty years old. His name is Sin You in China, but his American name is Joe Folsom. He lives at the Folsom Ranch in Lassen County, California, and the facts

MR. SIN YOU.

which I am about to relate can be verified by any of the operators on the California and Oregon Telegraph Company's lines.

Joe, as he is known by the operators (and he signs "J"), is well liked by all who know him. He is accommodating and pleasant on the line, always willing to render any assistance possible, and when lines are working hard do all in his power to get business along. Joe can read and write and can take any telegraphic message that is sent him. He, of course, is not familiar with all the words in our language, but will receive them as sent and copy them correctly, delivering message verbatim as transmitted. The Folsom Ranch office is equipped with a set of Atkinson repeaters and it falls to Joe's duty to attend to them at times. These he understands thoroughly, and anyone operating them with him would be surprised (if they did not know) to learn that they were telegraphing with an ordinary Chinaman. One particular feature in Joe's operating is that he has all the peculirities of his teacher (Mrs. Folsom) in his sending, and it is hard to distinguish one from the other in their writing. Chinamen are noted for their ability to imitate.

Joe is as good on the telephone and understands the working of the instruments, switches, etc., thoroughly. He built a local telegraph line, with two instruments connected, and manipulates this entirely by himself, the line being two miles in length. He is proficient in the manipulation of all instruments, batteries, switchboards, etc., connected with the telegraph and telephone.

Joe is in for all American ideas. He is thoughtful and reasonable and enjoys all kinds of sport. He is an adept on the bicycle, handles a gun with the best of them; can catch brook trout when others fail and will make the average vaquero ashamed of himself when it comes to separating cattle and riding a bucking mustang. He has a camera and is learning how to take pictures.

Joe is one of those unassuming fellows that never "shoves" himself ahead, but is retiring, preferring others to judge of his abilities and fitness. He always prefers to give the best of everything to others, taking what remains for himself.

Most Chinamen (characteristic of the race) if given the least prominence or made anything of will become so pompous and important that it is impossible to do anything with them. But this is not the case with Joe. With all his ability and knowledge he is the same unassuming Chinaman that he has always been and attends faithfully to his duties as cook; and he is hard to beat in this capacity.

Mrs. Folsom, the manager of the Folsom Ranch office, deserves the credit of being the tutor of this remarkable Chinaman. When she started to teach him she thought it would be an impossibility to get him to distinguish the difference between sounds, more particularly when he began to learn the letters of the alphabet. He could distinguish no difference between the articulate sounds of the letters b and n, and after he had overcome this difficulty to some extent it seemed almost an utter impossibility to get him to distinguish between the sounds of the words horse and house. But she labored with him persistently until she brought him to the perfection he has now attained.

While in Hong Kong a couple of years ago Joe was offered a position in the main telegraph office of that city, but his retiring nature and lack of personal importance caused him to refuse the offer, preferring rather to return to the Folsom Ranch and assume his duties as cook.

N. S. McK.

THE ORIGIN OF THE TELEPHONE.

The principle of the telephone, that sounds could be conveyed to a distance by a distended wire, was demonstrated by Robert Hook in 1667, says the Pueblo Chieftain, but no practical application was made of the discovery until 1821, when Professor Wheatstone exhibited his "Enchanted Lyre," in which the sounds of a music box were conveyed from a cellar to upper rooms. The first true discoverer of the speaking telephone, however, was Johann Philipp Reis, a German scientist and professor in the Institute of Friedrichsdorf. On the 25th of April, 1861, Reis exhibited his telephone at Frankfort. This contained all the essential features of the modern telephone, but as its commercial value was not at all comprehended little attention was paid to it. Reis, after trying in vain to arouse the interest of scientists in his discovery, died in 1874 without having reaped any advantage from it, and there is no doubt that his death was hastened by the distress of mind caused by his continual rebuffs. Meanwhile, the idea was being worked into more practical shape by other persons, including Professor Dolbear of Tufts College, Mass., Professor Elisha Gray and A. G. Bell, and later by Mr. Edison. Professor Bell was the first to perfect his patent. On February 12, 1877, Bell's articulating telephone was tested by experiments at Boston and Salem, Mass., and was found to convey sounds distinctly from one place to the other—a distance of eight miles. This telephone was exhibited widely in this country and in Europe during that year and telephone companies were established to bring it into general use. Edison's carbon "loud speaking" telephone was brought out in 1878.

The examiner of patents at Washington, July 21, 1883, decided that Professor Bell was the first inventor because he was the first to complete his invention and secure a full patent. Since 1878 there have been many improvements in the different parts of the telephone, rendering it now nearly perfect in its working.

"Have been pleased with your paper. It is just what we need.

R. E. PEDIGO,
Chariton, Iowa."

OUR TELEPHONE.

You didn't know we had a 'phone?
  It's stood here 'most a year.
Why, papa says for that alone
  He'd give up lots o' things. It's dear,
But mamma says that life is worth
  Just twice as much since it's been here,
    That telephone.

She tells the grocerman to bring
  Our food up "right away," and when
The wrong thing comes—why, "ting-a-ling,"
  She scolds the grocerman, and then

He sends the bestest things he's got,
  And 'pologizes 'gain and 'gain,
    Through our 'phone.

Sometimes she calls up Auntie May,
  Who lives 'way, 'way up town, and 'vites
Her over for the day—hurray!
  It's jolly fun, for auntie wites
Cute jingles, pictures draws, and once
  We meow'd like cats with all our might,
    Through the 'phone.

One night I had a stomach ache;
  'Twas dreffful bad, I guess. They rang
For Doctor Brown to come and take
  It right away, but he just sang
Out through the 'phone, "Give ginger tea,"
  And I got cured, quick as "go-bang!"
    Through the 'phone.

But O, the times that I like best
  Are when my papa rings. I run
To get there 'head of mamma, lest
  I lose my chance. It's lots of fun
To hear his voice, so far away,
  "Hang up the 'ceiver, child, when done
    With the 'phone."

Sometimes he asks me what I'd like
  From town, and gener'ly I say:
"Marshmellows or a brand new bike."
  And then he always laughs; I play
I'm mad, and then he calls me "dear,"
  Or "sweetheart." My! but talking's gay
    Through our 'phone.

Sometimes it's very 'portant things,
  That 'praps he'll stay in town;
Or that a guest or two he brings
  Out home; that's fun for me,
'Cause we have jelly then, and cream,
  You'd better get, why, yes-sir-ee!
    A telephone.

—*Antha Knowlton Miller in the Telephone.*

NEW INDEPENDENT SERVICE IN CHCAGO.

The Illinois Telephone and Telegraph Company has drawn plans and made contracts for installing an exchange of 25,000 telephones in the business district by July 1. It proposes to get a foothold in Chicago by putting the telephones to new uses as well as by employing new methods in the telephone business, and offering, according to its claim, improved service.

"Chicago is the only large city of America in which an Independent telephone company has a chance to get a start," said President Wheeler of the company. "That is because the business district is congested here, with practically all business done within a territory one and one-half miles square. Sixty-five per cent of the telephone calls and answers are within this district.

"Now we propose to put a telephone on the wall or the desk of every business man in the district and to put one into every public office, as in the city hall and county building. They will be put in free, as a gas meter is put in. They will connect public offices and persons having business with them, such as lawyers and contractors; they will connect banks with their attorneys and customers, attorneys with their important business clients, insurance agents with each other and with underwriters, real estate men with their real estate board, their attorneys and their customers; board of trade men and brokers with the board or stock exchange and customers, and so on.

"The service offered by our 'phones will be absolutely secret, as we use an automatic switchboard. No 'hello girl' and no employe, as in an office where there are several phones operated from a private switchboard, can listen while a banker or lawyer talks with a client on a professional matter. Therefore we believe that business people will find use for our phone, since it will cost nohing to have it put in and will cost only five cents a call to use, with a guaranty that the total cost shall not exceed $85 a year. The calls will be registered automatically by a meter and there will be no nickel-in-the-slot annoyance."

The Illinois Telephone and Telegraph Company, in getting ready for this business, has completed more than half its wire tunnels under the downtown streets. Its backers, organized as the Automatic Electric Company, have recently bought the patents on the Strowger automatic switchboard, which will be used there, and the West Side factory for making it.

A NEW METHOD FOR THE SUPERVISION OF OPERATORS.

BY HARRY S. COYLE.

One of the most difficult and heretofore indeterminal problems in exchange management is the supervision of the operative force.

If any attempt were made to rectify the existing systems of operative supervision, it was always accomplished by a system of rules and regulations which were enforced rigidly at spasmodic periods, and were then allowed to gradually relax until the manager was again overwhelmed with complaints. It is needless to say that the results of such a system of supervision is poor service. A perfect supervision of operators cannot be accomplished by rules and regulations alone. We must of a necessity have some means of enforcing these rules. It is not necessary for me to ask how many complaints do you receive in a day from subscribers for a violation of your rules by the operators? Or how often are these rules violated which are not reported to you?

A perfect supervision of the operative force can only be accomplished by a mechanical system—a system that will indicate automatically the movements of each and every operator.

The rules and regulations of modern exchange practice would fill a volume; and of course we must employ a definite number of such rules under any system of supervision, however perfect it may be in its operations.

While governed by a good system of supervision it would not be necessary to hamper the operators with a long list of rules which cannot be enforced. We have no quarrel with the rules and regulations of exchange practice, but we do protest against the methods of enforcing these rules.

How to enforce the rules and regulations of operative supervision has been the enigma of the exchange manager's thought.

It is of the utmost importance that proper rules for the government of the operators of a telephone company should be literally and absolutely enforced, in order to make such rules efficient. If they cannot, or ought not to be enforced, they ought not to exist.

If in the judgment of anyone whose duty it is to enforce a rule, such rule cannot or ought not to be enforced, she should bring it to the attention of those in authority. It will be my task to tell how these problems of operative supervision have been successfully solved by an ingenious supervisory system which was suggested by Mr. L. W. Stanton, of the Federal Telephone Company. This system is in successful operation at the exchange of the Cuyahoga Telephone Company of Cleveland. This system of supervision is really a visual sign system—the flash light, by means of which the monitors and chief operators are kept constantly in touch with each and every operator; in fact, each operator is constantly under supervision from the moment she takes her seat at the switchboard until she leaves it.

This system fulfills every definition of the word "supervision." Under its operation the monitors and chief operators are enabled to see every movement of each operator, and, if necessary, have a perfect supervision over the conversations of every operator.

Mr. Stanton's experiments along these lines led him to adopt the visual sign system, for the eye is adapted to the detection of motions unmeasurably minute—the rhythm of dancing light. The motions which are at the foundation of hearing are exceedingly slow when compared with the motions which are at the foundation of vision. Light flies, while sound creeps. The capacity of human vision is almost unlimited, while the unaided audition is limited to a few miles at most.

I speak of these facts to impress upon you the great distinctions that lie between the motions that give rise to sound and the motions which are at the foundations of vision. These physical laws have been an important factor in the history of telegraphy and its crowning achievement—the telephone. The laws of sound and optics are finding novel phases daily in telephone practice. The supervisory system that I am now describing is an application of these laws to a practical invention.

The exchange of the Cuyahoga Telephone Company is equipped with the Kellogg divided multiple switchboard, which consist of four divisions, namely, A, C, M and R. Each division consists of ten sections, and each section of three positions. Each division is governed by a monitor, while the entire board is under the supervision of the chief operator. The switchboard is wired so that the line drops of each position are made common with each other, and connected with lamps on the desks of the monitor and chief operator. The lamp corresponds with the operator's position at the switchboard. Each position on the switchboard is controlled by two separated lamps, one for connecting and the other for disconnecting. These two lamps act as indicators, to show the speed of answering and disconnecting. The monitor's desk contains a lamp for each position on the division of the switchboard under her supervision, while the desk of the chief operator is equipped with a lamp for every position on the entire switchboard. It is a beautiful sight to stand at this desk and watch the twinkling of the lamps that register each call as it comes in, and tell when each subscriber has hung up his receiver.

Ten thousand lines come into this exchange, and each call is registered at this desk. It is indeed a wonderful sight, and I think it stands as a symbol for the instrumentation of the human imagination in solving scientific problems. When a subscriber presses the button corresponding to the board desired, a drop falls, and through the action of the relays of that position it closes the circuit and lights the lamps on the desks of the monitor and chief operator. These lamps indicate the position on the switchboard. When the call is answered and the drop restored to its normal position the lights are extinguished, thus giving a true record of the time consumed in answering this call. The multiple jacks are made common with each other, and so wired that when a subscriber hangs up his receiver it closes the circuit through the action of the relay, and lights a red lamp on the desk of the monitor and chief operator, and in like manner this lamp indicates the operator's position on the switchboard. When the operator pulls down the connections this lamp is extinguished, thus giving a true record of the time consumed in disconnecting. Each operator's position at the switchboard is equipped with a special induction coil having three winding; through the tertiary winding of this coil a line is tapped and connected to a jack of what is termed a "listening in desk," and a trained operator sits at this desk and listens in on the individual operator without her knowledge, and in this way is able to know what kind of service each operator is giving. This trained operator receives all complaints of poor service, discourtesies on the part of the operator, and the little odds and ends that go to make up the report of dissatisfied subscribers.

This desk is connected with every position on the local switchboard, and the toll board as well, and by means of the arrangement that I have described above the supervisor at this desk is enabled to have a complete knowledge of the conversations of each and every operator with the public.

Suppose a subscriber would send in a complaint against an operator; this operator would immediately be placed under supervision and her position at the switchboard would be under constant supervision; that is, every word she spoke to subscribers would be known at this desk. One of the greatest drawbacks to the use of the telephone for private conversation is the want of security from the prying operator. Under this system the practice is now impossible, and any operator attempting to cut in on a busy line to listen is readily detected.

When the operators understand that every word they speak to the public is heard at this desk, and their speed in

connecting and disconnecting is known, then, and then only, can we expect good service and a well disciplined operating force. The simplicity and desirability of these methods are obvious to all, and it is the only system in operation that will enable the management of a telephone company to have a perfect supervision over the operating force. Under the operations of this system the service is seventy-five per cent better than can be obtained under any other method in use.

Exchange managers are gradually learning that it is easier to supervise their operating forces by a mechanical system—the flash light—than by a system of rules and regulations which are enforced verbally. Under the flash-light system the monitors and chief operator have at times a perfect visual supervision over each individual operator. It will not be necessary to read the rules of your exchange more than once to each operator. Any violation of the same is readily detected.

Under the old systems of operative supervision a monitor and several assistants were required to supervise a given number of sections, and the results were what may be termed a fair but costly service was rendered to the public. By having a perfect supervision over the operating force we can obtain the best service possible, and instead of having the switchboard filled with a force of idle operators we can divide the work among a given number of operators and keep the same standard of service without unduly overcrowding the operators.

Such problems of better service and economy in exchange practice must be studied and practiced by all companies that work for success.

AMERICAN PRACTICE IN BELGIUM.

The most recent American practice in telephone construction is followed in Belgium probably more than in any other country of Europe, says Consul George W. Roosevelt, in a report to the State Department at Washington, D. C. On account of dissatisfaction with the present system of telephone subscription, by which all subscribers are assessed alike for yearly local privileges, the Minister of Railways, Posts and Telegraphs has decided that it will be abandoned in favor of the more rational message system, which is expected to bring about an enormous increase in telephonic communication. Seven years ago, at an expense of $1,200,000, the Belgian government obtained a monopoly of telephonic communication, absorbing the interests of the two main companies and various smaller organizations.

For telephonic purposes Belgium is divided into seventeen zones or areas, each with a large central exchange. These zones are not arbitrarily assigned, but allotted, and very successfully, to obtain the most efficient service. Nearly all the local service of Belgium is dependent upon the single-wire, non-metallic circuit system, but the government is slowly making changes. The two zones of Brussels and Charleroi are now nearly entirely equipped with metallic circuits; the zones of Antwerp and Liege are under study.

International trunk lines now connect with France, Germany, Holland and the Grand Duchy of Luxemburg. There are four direct lines between Brussels and Paris. A line with England is under construction. The land lines are now quite finished, and the cable is being laid. All the international lines are of the metallic-circuit type.

Rates for international service are for five minutes and are governed by distance and the period of day or night. The minimum rate is 29 cents by day and 17 cents by night. The total number of messages sent was 120,075, an increase of 30,560.

As to out-of-door work in Belgium, as compared with that done in the United States, the only notable difference consists in the use of more iron structures—that is, more iron poles and iron fixtures. In Germany, Switzerland and Belgium expensive and ornamental iron poles are quite general in the cities.

Nearly all the instruments, exchange paraphernalia, etc., of Belgium are manufactured by a company in Antwerp, and although this company is distinctly a Belgian concern, its output is designed, with slight modifications; in accordance with the most recent American improvements.

HOW TO USE A TELEPHONE.

"Talk louder," "Don't yell so," "Get closer to the instrument," "Don't talk so far away—can't hear a word you say," are some of the messages sent by people who use the telephone to the person at the other end of the line The words are often accompanied with evidences of ill will and impatience, at which the telephone operators smile.

"Every time I hear a remark of that kind," said the manager of a large exchange, "I am confirmed in the belief that, despite its popularity, everybody does not know how to use the telephone."

"One of the mistakes made by many people who use the telephone is that they do not place the lips close enough to the instruments. Some people make this error because they can't forget the old-style instrument. In order to obtain the best results with it it was necessary to keep the lips a few inches from the box and to speak across the opening and not into it. 'Get further away from the 'phone,' was the cry when the old-style instrument was in use, and some old subscribers have this 'distant habit,' as the telephone people call it, and they are usually told by the one at the other end to 'talk louder.'

"If I were to lay down a rule of speaking on the telephone, I should say: Keep the chin well raised and speak with a large amount of air in the chest, articulate slowly and distinctly and use the lips—that is, place the voice in the front of the mouth."

Independent telephone companies galore, organized in almost all of the large and small cities in Iowa, and tapping every point in the state that is worth reaching, gives promise that the anti-Bell fight in Iowa will be spirited this year. The low price of copper during the past few months has enabled these small competitors of the Bell to arrange to rebuild their old circuits and to make new connections. Several companies are going in on a large scale, building trunk lines between the larger cities and also providing intermediate but separate connections.

In many towns local companies have been organized co-operatively, merchants and professional men capitalizing the companies and extending lines into the farming districts for miles around. These companies have been remarkably successful thus far and many new ones will be organized this year. Telephone people say that 1902 will be a phenomenal year in telephone building in Iowa.

REORGANIZED.

At a recent meeting of the directors of the Vought-Berger Company, La Crosse, Wis., C. A. Sterling was elected president, C. W. Thompson, vice-president, and M. I. Berger, secretary and treasurer. Mr. Berger will also assume the duties of general manager. On March 1 Mr. G. L. Saunders joined the company's corps of telephone engineers. Mr. Saunders is an engineer of marked ability and wide experience both in telephone manufacturing and construction work.

In order to supply the growing demand for its pendent telephone the company has been compelled to move into larger quarters, where, with improved equipment and increased capacity, it will be in a position to give its many patrons better service than ever before. In the machine shop, well fitted with the latest type machines and labor-saving tools, patterns and dies are being rapidly turned out for the new V.-B. switchboard, which will appear on the market April 1.

The company, with strong financial backing, controlling valuable patents, is becoming an important factor in the Independent telephone field.